AMPEX
DCT 1700d
Digital Component Tape Drive

Operation

AMPEX
DCT

Electronic Edition Ver E1.0a : February, 1998

Please send corrections / comments to:
Douglas Korte
Ampex Corporation
Doug_Korte@Ampex.com
805-250-0649
805-250-0652 (fax)

Prepared by

Ampex Corporation
500 Broadway
Redwood City, CA 94063-3199

Table of Contents

Section 4   Setup (continued)

Section 4   Setup (continued)

Section 5   Basic Operation

Section 6   Editing

Section 6   Contents (continued)

Section 7   Operator Diagnostics

AMPEX
DCT 1700d

Digital Component Tape Drive

Operation

GENERAL INFORMATION 1

Section 1
General Information

Section 1 Contents

1.0 Manual Outline

This manual provides operational information about the AMPEX DCT® 1700d digital component tape drive. Tape operators, video editors, and service engineers should use it as a guide and reference.

The manual contains eight sections.

- Section 1 introduces the DCT 1700d.

- Section 2 explains the Front Panel Controls and Indicators.

- Section 3 explains the Control Panel Menus.

- Section 4 explains Setup procedures and Timecode.

- Section 5 describes basic Machine Operation.

- Section 6 describes Editing Procedures.

- Section 7 describes Status and Diagnostics.

- Section 8 is a Glossary of terms used in Editing & Setup.

1.1   Conventions used in this manual

The manual uses the following conventions:

- Tape transport function related buttons located on the lower right of the front panel are indicated in upper case bold italics, using a sans-serif typeface, e.g. *REC., PLAY , READY, JOG,* as their legends are seen on the actual illuminated button. The exception is shuttle, which is indicated by *<shuttle>*, instead of only the *<<>>* symbol as the button is marked.

- Menu-related push buttons, on the upper right quadrant of the front panel, are indicated in lower case bold italics, using a sans-serif typeface, e.g*. unity, entry, editor,* as their legends are seen on the actual button.

- Soft keys and sub-menu selections are indicated in an upper case, bold, serif typeface (Times), *e.g*. **DIAG, TRACKING, ANIMATION**.

- Items selected and tallied on the LCD screen are indicated in lower case italics using a serif typeface (Times), e.g.. *vitc = ltc, full frame, 8dbm*

- Menu names begin with an initial uppercase character, e.g. Setup menu.

- Default settings appear in bold italics type, e.g. ***on***, ***off***.

1.2   Product features and capabilities

The DCT 1700d is a digital component tape drive which is 625/525 switchable, designed specifically for post-production, Film to Tape Transfer and Archival applications. On a single cartridge the tape drive can record and reproduce anything from a spot commercial to a full-length movie.

The DCT 1700d has the high speed ballistics expected of a post production product and is the highest performance digital component tape drive in the industry. A list of product features is found in Table 1-1.

Table 1.1 Standard features and capabilities

Feature	Benefit
Digital component technology	The higher quality video environment that most post-producers prefer
High speed tape-drive ballistics	The fastest transport response time in the industry, recueing a 30-second segment in less than 1.5 seconds
Air-lubricated guides	A smooth, low-friction environment for fast, gentle tape handling
Individually replaceable heads	Head replacement in minutes without replacing the entire upper drum or head wheel—no special tools needed
Three cartridge sizes	Up to three hours of recording time
525/625 switchability	Multiple standards in a single system
Auto-edit optimization	Automatic adjustment of the tracking and scanner phase
Slow-motion digital video processing	Flawless images during variable speed playback with no bounce or blur.
Flying erase heads	Improved margins for editing
3.5" floppy disk drive	Easily updated software for system enhancement, and storage of user setup files.
Real-time diagnostics	Constant monitoring of performance to ensure optimum operational parameters and to facilitate preventive maintenance
Animation mode with 1 second cycle time	A storage device for computer graphics and film transfer systems that require frame-by-frame or field-by-field animation

Table 1.1 Standard features and capabilities (continued)

Feature	Benefit
Full frame storage	The ability to freeze an image off tape and display either field one, field two, or a full frame
Audio SELSYNC capability	The ability to play back any combination of digital audio tracks and record to a specific track all in the same edit pass
Analog audio interface	Interface to existing analog audio equipment
AES audio interface	Ensures compatibility with audio industry standard digital equipment
Optional serial digital interface with embedded audio	Signal distribution with a single coax that carries digital video and four channels of embedded digital audio & VITC
Four high quality audio channels	48 KHz sampling for superior quality and full editing capability
Audio channel mix to cue channel	Mixing of any or all of the four digital audio tracks to the cue channel, with auto switching to the Cue track in Shuttle
Multi-cue search to cue	For sports or tape screen applications, one hundred cue points stored in non-volatile memory
Single button striping of tape	Saves time for the tape operator, once the format of Black duration, starting time, color bar duration and source have been established it is a simple job to prestripe tapes.
Parallel digital video interfaces (embedded audio)	An economical alternative to serial interface for maximum interface flexibility
Composite analog monitor output with burnt-in time code	The ability to create video dubs to composite recorders without external hardware, also permits economical picture monitoring
625/25 frame Record with 625/24 frame Playback	Ideal for 'PAL' to 'NTSC' Conversions and Film Synchronization (optional 625/24 Record with 24 or 25 frame playback upgrade available)

1.3   DCT Cartridges

The DCT 1700d handles small, medium and large DCT cartridge sizes (See Table 1.2). It can automatically load and thread any DCT cartridge in under four seconds.

The DCT 1700d has sensors for four cartridge holes, as shown in Figure 1.01. The hole in the middle of the cartridge is a record lockout, and the others are unused. The plugs in the holes indicate whether the cartridge is in locked or record mode.

The purpose of the Record Lockout plug is to safeguard against accidental recording of a prerecorded master tape.

#4 Unused

DCT
Tape

#1 Record lockout plug

#2
Unused

#3 Unused
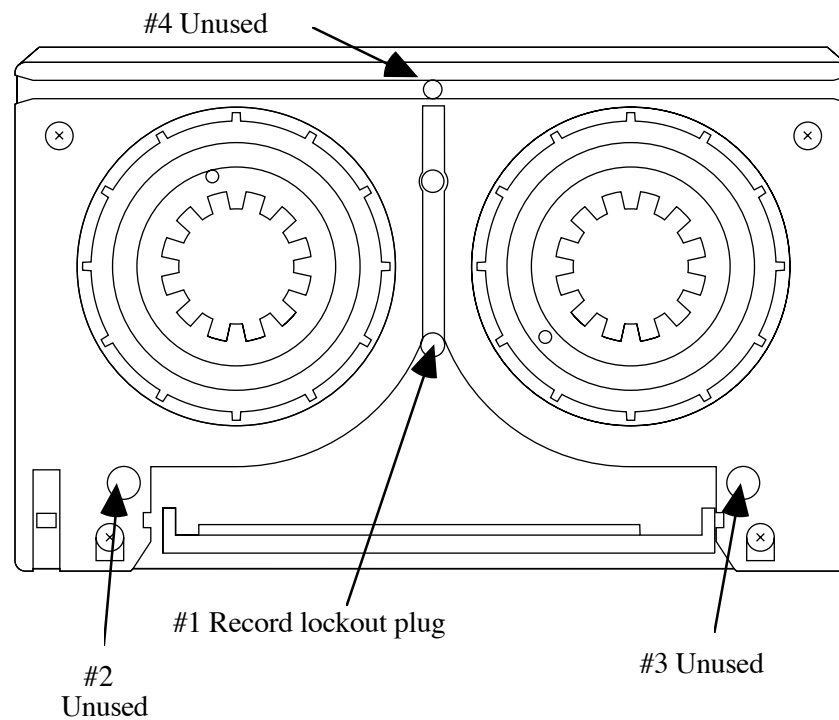
Figure 1.01 Lockout plugs

Cartridge Record Lockout

Viewed from the top of the cartridge, if the cartridge is in the locked position, the plug is raised and the arrow on it points to LOCK. If the record cartridge is in the record mode, the plug is lowered and the arrow points to RECORD (see figure 1.02). To change the cartridge from record to lockout mode or vice versa, a screwdriver is used to push in, and turn the plug 180 degrees in the direction required.
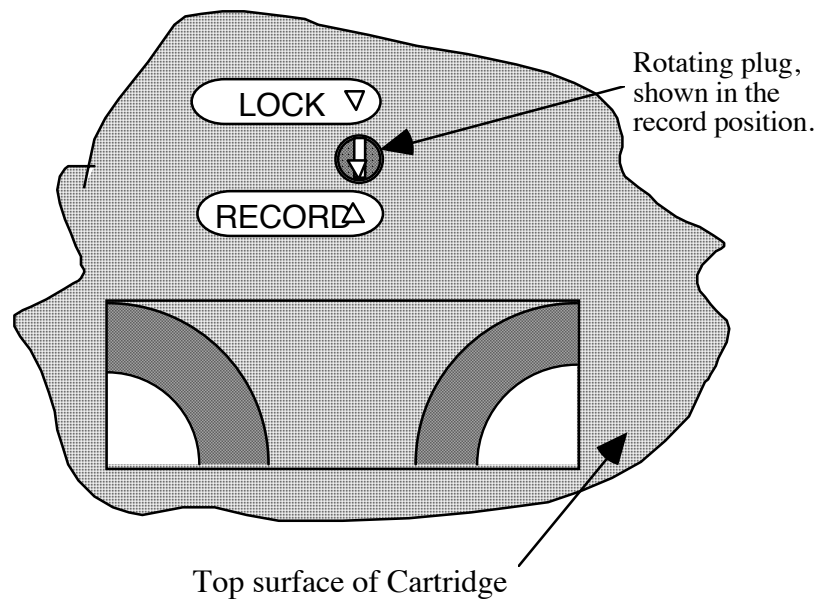
Figure 1.02 Record / Lock plug

After loading, if the cartridge is in the locked position, the drive screen displays this message:

- CARTRIDGE LOCKOUT -

Table 1.2   DCT Cartridge Lockout Protection

User Plug 1	Cartridge Record Lockout Configuration
lowered	Total record enable
raised	Total record lockout

Master (Drive) Record Lockout

You can also achieve total record lockout by toggling the switch underneath the front panel.
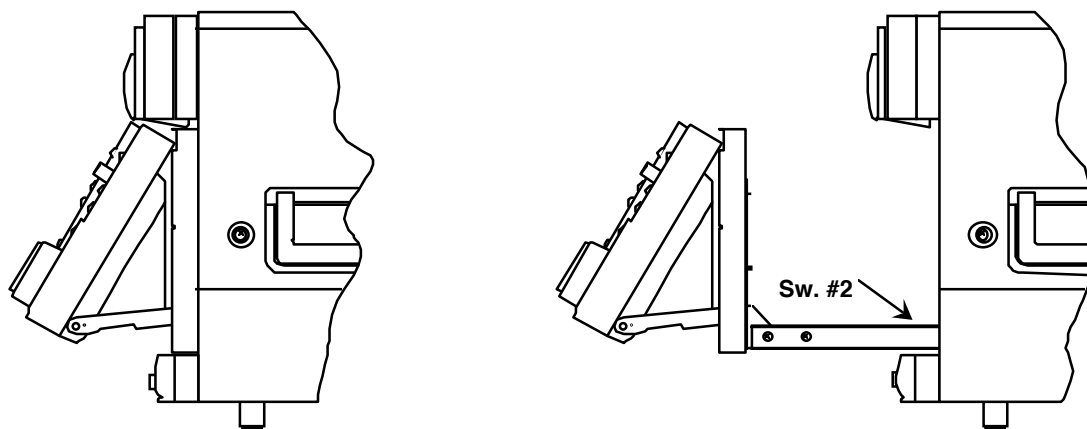
Figure 1.03 Showing location of the RECORD INHIBIT switch

When the RECORD INHIBIT switch is in the lockout position, the DCT 1700d drive displays the message :

- MASTER LOCKOUT -

1.3.1   Recording times

Table 1.3 shows the maximum recording time for each of the eight cartridge sizes. The 35 minute and the 100 minute tapes are to specifically cater for 625 programming which are 30 minutes and 90 minutes in length respectively.

Table 1.3   DCT Cartridge Specifications

Tape Specs

Video Tape Cartridge	Maximum Recording Time 525/625	Physical Dimensions L x W x D in mm
DCT 10	13 minutes/11 minutes	172 x 109 x 33
DCT 30	33 minutes/29 minutes	172 x 109 x 33
DCT 35	38 minutes/35 minutes	254 x 150 x 33
DCT 60	72 minutes/64 minutes	254 x 150 x 33
DCT 90	95 minutes/85 minutes	254 x 150 x 33
DCT 100	112 minutes/100 minutes	366 x 206 x 33
DCT 120	138 minutes/124 minutes	366 x 206 x 33
DCT 200	210 minutes/189 minutes	366 x 206 x 33

1.3.2   Recorded Information

Video/Audio/Cue Track/Timecode Track/Control Track

1.4   Connections

The DCT 1700d drive has connections for the following:

AES Audio.

Analog Audio.

Serial Video (with embedded audio).

Parallel Video (with embedded audio).

Analog Video (Monitor output, Reference, Waveform Monitoring).

Timecode and Cue Track audio.

Remote Interfaces (Remote Machine control - Edit controllers).
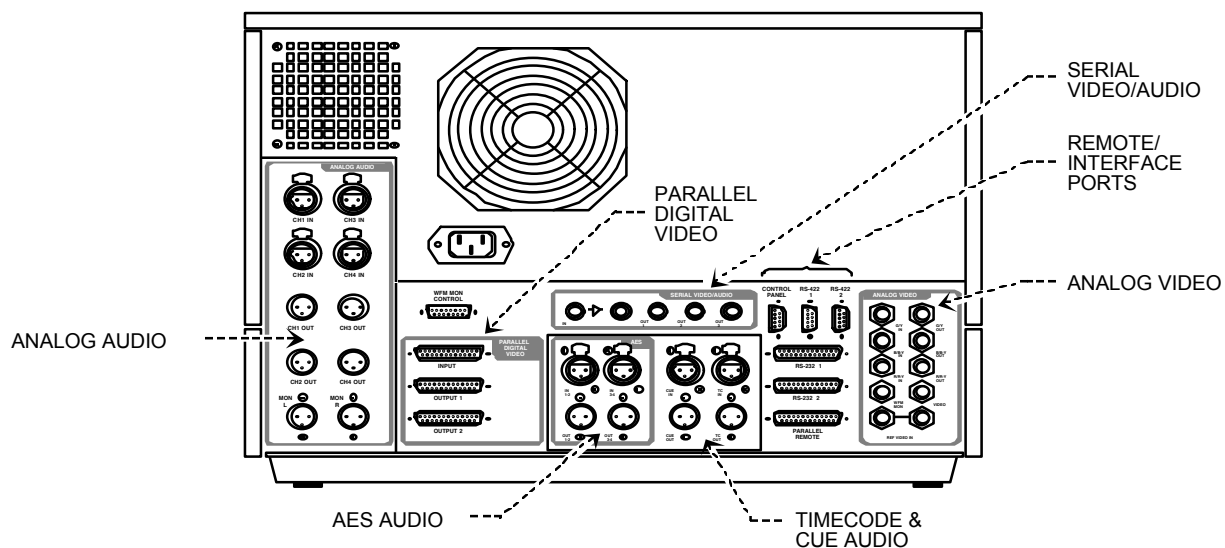
Figure 1.04 Showing Audio , Video & Interface Connectors

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DCT 1700d

Digital Component Tape Drive

Operation

GETTING STARTED   2

Section 2
Getting Started

This section explains the function and location of the various controls and indicators. This information is sufficient to allow the operator to Power-up the DCT 1700d and use the primary Function, Transport and Menu controls.

Section 2   Contents

Figure 2-01 shows the front panel.

2.1 Power on/off switch

The on/off switch is located at the bottom left of the drive (See fig 2.01 above).

2.2 Tape cartridge *eject* push-button

The *eject* push-button for the tape cartridge is at the top left of the front panel (See fig 2.01 above). This control is active for all transport modes and will first perform an unthread cycle if required and then eject the cartridge. A second method of ejecting the cartridge is with the *home*, DIAG, TRANSPORT, EJECT menu function. Also a rewind/eject command can be issued by simultaneously depressing the *stop* and *<SHUTTLE>* keys. This function first unthreads the transport if required, then rewinds the cartridge to the beginning of tape and finally ejects the cartridge.

2.3 The Menu Display LCD screen

The Menu Display LCD screen in the upper left quadrant of the panel (See fig 2.01) is the primary means of user feedback for the tape drive. Variations in ambient temperature and viewing angle may affect the display contrast and require the user to re-adjust this to optimum. Adjustment is performed by simultaneously depressing the *home* menu push-button and rotating the adjust knob until the required contrast ratio is obtained (See fig 2.04).

The display includes tape and time information, audio metering, editor status indication, record channel enable indication, keypad data and information pertaining to the current menu selection.
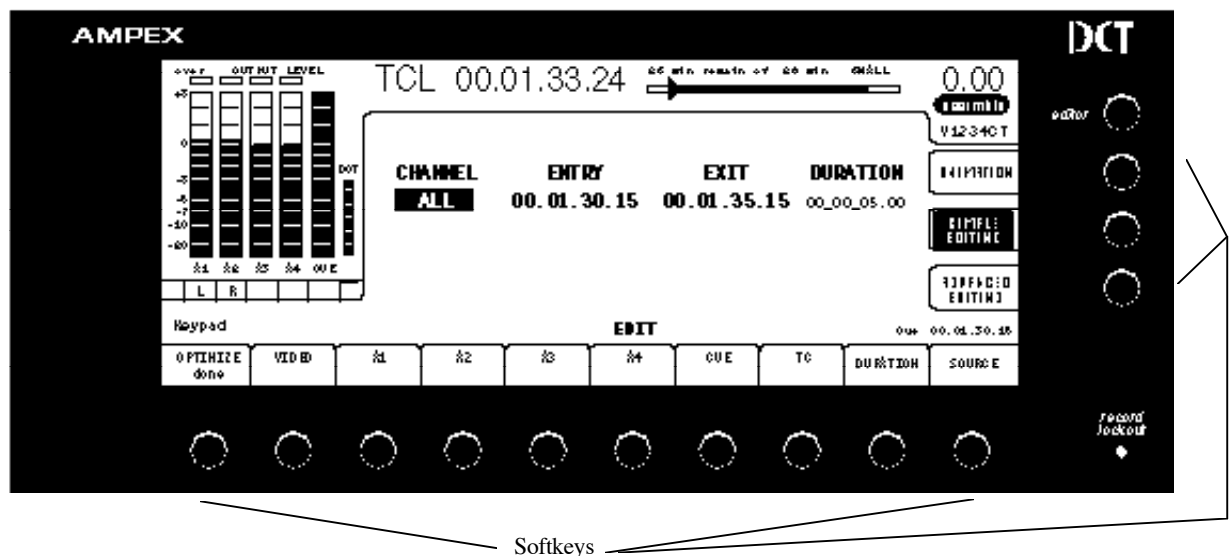
Softkeys

Figure 2.02 LCD Menu Display Screen

2.4 Soft keys

The soft keys are located around the Menu Display in the following fashion. The lower portion of the display is sectioned into ten soft-label areas, and the right hand portion of the display is sectioned into three soft key-label areas. Each of these areas has a corresponding soft key immediately below or to the right of the label area. In general those soft keys to the bottom of the display control menu functions and those to the right select further menus. If a function soft key is active, it will always display a function label, and may display a state indicator or value. If a menu soft-push-button is active, it will always display the name of the menu it will reach in bold type.

There are three control push-buttons used in conjunction with the soft keys. See table 2.1 for details, Figures 2.02 and 2.03 for positioning of the controls.

Table 2.1 Control buttons associated with soft keys

Control	Function
entry	Enters either keypad or tape time into selected register.
exit	Enters either keypad or tape time into selected register.
editor	Selects editor mode between off, insert and assemble.

2.5   The Numeric keypad

The numeric keypad is located to the lower left of the front panel and is immediately above the power switch. This keypad is used to enter timecode, cue point to search to, and other edit points when using machine-to-machine editing. There are two other buttons located to the right of the numeric keypad that are used in conjunction with the keypad. These are the *entry* and *exit* buttons, which are used to define entry and exit point when editing and to enter other numeric data.
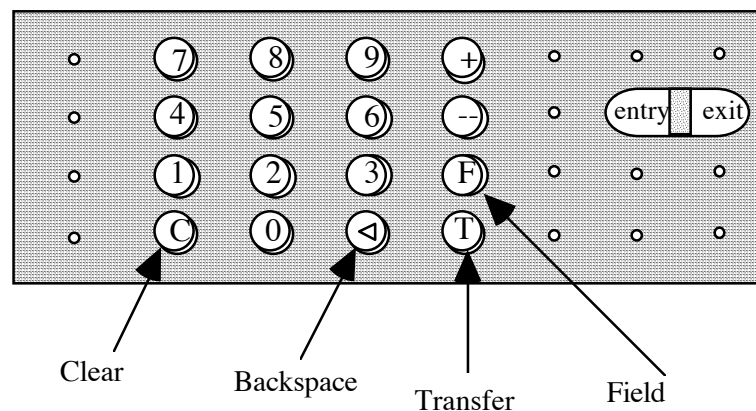
Figure 2.03 Keypad Entry Keys

Table 2.2 Numeric keypad functions

Key	Function
entry	Enters either keypad or tape time into selected register.
exit	Enters either keypad or tape time into selected register.
0 through 9	Enters respective numeric values into keypad register.
C	Clears keypad register if not empty or if empty loads "CLEAR" for transfer.
<	Backspace.
T	Transfer selected register to keypad register.
F	Toggles keypad register time between field 1 and field 2.
-	Toggles subtract operand on keypad register.
+	Toggles addition operand on keypad register.

2.6 Menu Selection and Function push-buttons

The Menu select and Function push-buttons are located to the upper right hand portion of the front panel, see figure 2.04 for legend. As the DCT 1700d tape drive provides a substantial amount of setup and adjustment controls, all but the most essential functions have been combined into a software configurable menu system. This system consists of nine top-level menus, each containing further sub-menus if required. Direct access to each of the nine top-level menus is provided with nine dedicated menu select push-buttons located in the top right quadrant of the control panel.

Note: *There are two pairs of push-buttons with the same labels: a menu* **edit** *push-button and a function* edit *key; a menu* **cue** *push-button and a function* cue *key. Although their labels are similar, each provides a different function as described in the text.*

Press to activate remote port #1

Press to activate remote port #2

Press to activate remote port #3

LED indicates that mute is actuated

LED's indicate which remote port is active

Press to select output menu

Press to mute audio

Press to select setup menu

Press to select input menu

Adjust knob

rem 1   rem 2   rem 3   mute

setup   input   output

status   tc   mon

home   edit   cue   e/e   audio   unity

Selects the home menu, also press and hold while using the adjust knob to change screen contrast

Press to select edit menu

Press to select cue point menu

Press to select e/e mode of operation

Press and hold to use adjust knob to set audio monitor levels,

Press to set active parameter to Unity

LED indicates unity is actuated

Press to select Time code menu

LED indicates that the e/e mode is selected

Press to select Status menu

Press to select monitor menu

Indicates that audio adjust is actuated

Figure 2.04 Menu and Function Button legend

A full description of the menu system may be found in Section 3 of this document.

Table 2.3 Menu controls

Control	Function
setup	Selects the Setup menu for system setup.
input	Selects the Input menu for adjustment of the audio, cue, and video input levels. (Video monitor output switches to input video).
output	Selects the Output menu for adjustment of the audio, cue, and video output levels.
status	Selects Status menu for display of current status messages and modification of nonstandard and fault message reporting.
tc	Selects the Timecode Reader/Generator menu.
mon	Selects the Monitoring menu for control of audio and waveform monitor signals.
home	Selects the Home menu.
edit	Selects the Edit menu for editing or further choice of edit control.
cue	Selects the Search to Cue menu.

Table 2.4 Function controls

Control	Function
rem 1	Enables remote port 1. (Toggles on and off). (RS422 or RS 232).
rem 2	Enables remote port 2. (Toggles on and off). (RS422 or RS 232).
rem 3	Enables remote port 3. (Toggles on and off). (Parallel GPI only).
mute	Mutes audio monitor output.
e/e	Selects E/E preference. Enables E/E in non-play modes *(RECORD, VAR, JOG)*.
audio	Enables adjustment of audio monitor by adjust knob.
unity	Toggles selected adjustments between unity and variable values.

2.7   L.E.D. indicators

There are eight LED indicators on the control panel whose function is usually to indicate the status of each adjacent secondary control. The exception to this rule is the master record lockout indicator, which indicates the state of the master record lockout switch on the drive behind the control panel. The LEDs indicate as follows:

- **Record lockout** - recording prohibited by slide switch behind control panel, or any cartridge lockout.

- *rem 1, 2, 3* - indicates the state of the three remote selectors.

- *mute* - mute selected for audio monitoring

- *e/e* - **on** steady indicates *e/e* mode selected. Flashing indicates   record confidence.

- *audio* - indicates four audio channels in unity output gain

- *unity* - indicates four audio channels in unity input and output gain, Video gain, Setup, Chroma, Hue. (These parameters are adjustable via remote port only, and reset when the current cartridge is ejected).

2.8   The Adjust knob

The adjust knob is the smaller of the two knobs on the control panel (See Fig 2.04 for location) and has the function of adjusting variables selected by either the menu soft-keys or the Function push-buttons. The knob is a continuously rotating optical encoder device, so there are no end stops and software automatically scales the sensitivity of the knob to the required function. The use of the adjust knob for various adjustments is described in the section related to the specific variable to be controlled.

2.9   Transport Control push buttons

The primary function control push-buttons are those push-buttons that are usually used to initiate or change transport tape motion. They consist of twelve push-buttons grouped around the transport control knob in the lower right of the control panel (See Figure 2.01) One additional feature of these push-buttons is that they are internally illuminated to give transport state indication.

Table 2.5 Transport function push-buttons

Control	Function	Indicator color
CUE	Positions the tape to either active cue or keypad register, minus preroll.	amber
SRCH	Positions the tape to either active cue or keypad register.	amber
PREV	Performs preview of edit programmed through edit menu.	amber
EDIT	Performs edit, programmed through edit menu.	amber
REV	Reviews edit programmed through edit menu.	amber
READY	Threads helix, also clears scanner timeout (once).	amber
STOP	Stops transport tape mode.	amber
PLAY	Initiates transport play mode.	green
REC	Indicates record mode, *PLAY* and *REC* pressed together select record mode, and are both lit only during the preroll or postroll.	red
≪≫	Initiates transport shuttle mode controlled by the Control knob.	amber
JOG	Initiates transport jog mode controlled by the Control knob.	amber
VAR	Initiates transport variable play mode controlled by the Control knob.	amber

Figure 2.05 overview illustrates this group of push-buttons and the Transport Control Knob.
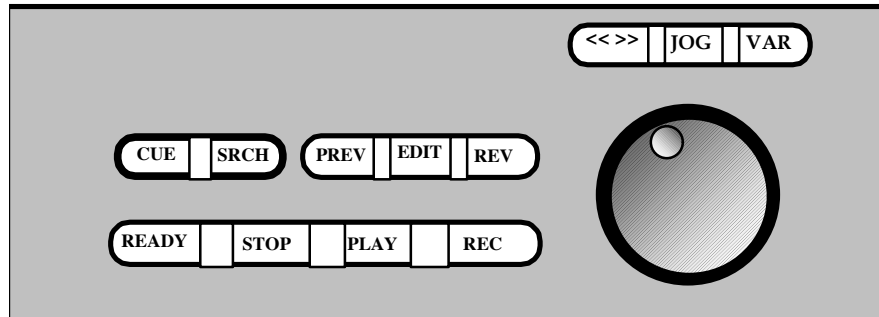
Figure 2.05 Transport Controls

Certain of these push-buttons have secondary functions indicated as follows:

-    *Cue* - positions tape to active cue register minus preroll if keypad register is empty, else positions tape to keypad register minus preroll.

-    *Srch* - positions tape to active cue register if keypad register is empty, else positions tape to keypad register.

-    *Edit* - if one of the edit menus is selected, simultaneous action on *EDIT* and *REC* will enter edit mode, performing a cue, preroll, edit and postroll. Pressing *PLAY* and *REC* together will enter edit/play mode, where *EDIT* will cycle the enabled channels in and out of edit record.

-    *Ready* - will always toggle helix threading if motion has stopped, but when helix time-out reaches zero the helix will unthread and the *READY* push-button will flash to indicate helix time-out.

-    *Stop* - will always stop tape motion and the *STOP* push-button will flash when helix time-out is imminent.

-    *Play* - will initiate play mode. If editor is off and *PLAY* and *REC* pressed simultaneously and record lockouts permit, crash record mode is initiated; or if editor is on, edit/play mode is initiated.

- *Rec* - (record) is used in conjunction with *PLAY* as described above.

- *<<Shuttle>>* - pressed simultaneously with *STOP* initiates rewind/eject sequence, also if shuttle pressed while transport in shuttle mode, shuttle velocity is zeroed.

2.10 The Transport Control knob

The Control knob is the larger of the two knobs on the control panel (See Figs 2.01 & 2.05 for location) and has the function of controlling all variable transport tape motion such as shuttle, jog and variable play. The knob is a continuously rotating encoder device with programmable tactile feedback that allows detents and end stops to be programmed according to current knob function. When the knob is not selected for any control, it adjusts the speed value that would be assumed if the transport were put into variable play. A secondary function of the control knob is to allow control of certain transport diagnostics as discussed in the diagnostics section.

2.11 Other tape drive user controls

2.11.1 Headphone connection and volume adjustment

On the lower right hand corner of the drive, a headphone jack and adjustment knob allows audio monitoring. The feed to this output is selected by the *mon* menu and other system setups that affect the audio monitoring. These will be discussed in the section related to monitoring. To monitor audio via external speakers, attach to the external monitoring connections on the rear of the drive. To monitor audio via headphones, a headphone plug should be inserted into the jack on the front of the drive. The knob next to the headphone jack adjusts only headphone monitoring level, not external monitoring level.

Note: Refer to Figure 2.01 for location.

2.11.2   Disk drive

Software updates for the DCT 1700d are contained on a DOS formatted 3.5" 1.44 MByte. floppy disks and are loaded via the disk drive at the bottom of the tape drive. To perform a software update, insert a disk with the required version of software on it into the disk drive and cycle power with the power switch on the lower left of the tape drive. The system will first check for a disk present then will test to ensure the new software is different from the existing software and finally check to ensure the new software is a valid version to load into the tape drive. The system will then transfer the new software to internal flash ROM memory and then run it. The disk drive also serves to store user setup data. (See section 4)

Note: The disk drive is also used for various maintenance functions. Refer to Figure 2.01 for location.

2.11.3   Master record lockout switch

The lower of the two switches behind the control panel selects master record lockout to prevent all recording operations.
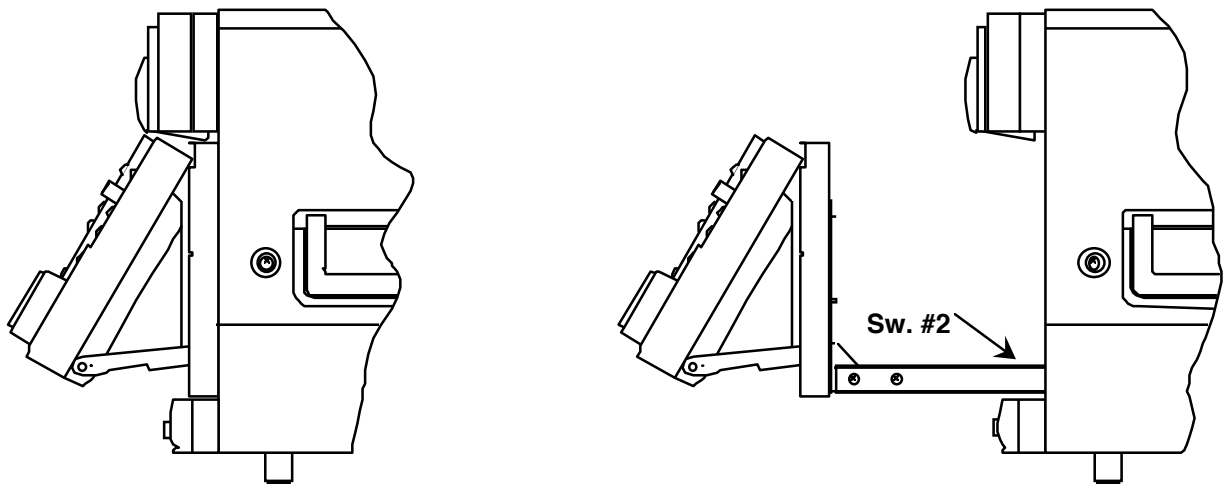
Figure 2.06 Illustrating the Record inhibit switch positioning

Figure 2.06 Above, illustrates the control panel pulled out into the lean forward position on the left, and the extended forward position with the location of switch #2, (the Record inhibit switch) on the right.

AMPEX
DCT 1700d

Digital Component Tape Drive

Operation

Menus	3

Section 3

Menus

This section will describe in detail the functions of all of the various menus and how they are accessed. It includes descriptions of the various controls and how they interact with the menus.

Section 3 Contents

Locating the various parts of the Control Panel, and their functions.
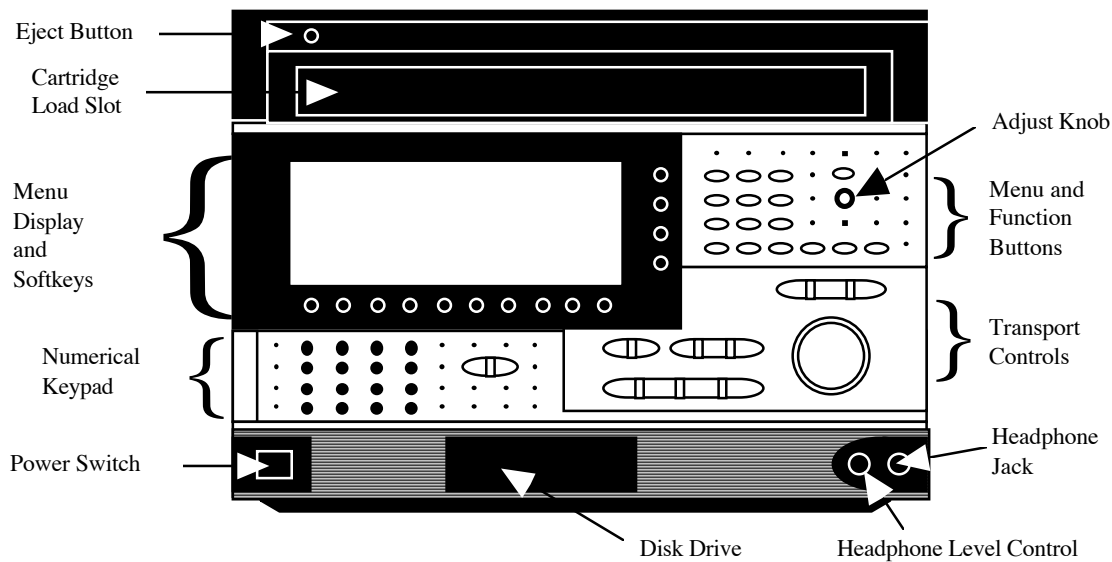
Figure 3.01 DCT 1700d Front Panel

As can been seen in Fig 3.01, the DCT 1700d Menu Display LCD is located approximately left of center on the Control Panel. It has a group of Softkeys located around the lower and right perimeter (See Fig 3.03 for greater detail).

Menu's are accessed by selections made using the Menu Select Push-buttons (See Fig 3.02 for greater detail), and the softkeys.

Numerical date entry is performed by using the Numerical keypad located below the screen (See Figure 3.05 for greater detail).

Press to select
setup menu

Press to select
input menu

Press to select
output menu

rem 1   rem 2   rem 3

setup   input   output

status   tc   mon

home   edit   cue

Selects the home
menu, also press and
hold while using
the adjust knob to
change screen contrast

Press to select
edit menu

Press to select
cue point menu

Press to select monitor menu

Press to select
Time code menu

Press to select Status menu

Figure 3.02 Menu Select Group of push-buttons.

First level menus are accessed by using the push-buttons located in the Menu Select group shown above in Figure 3.02 with a brief explanation of their function.

Subsequent level menus and operations use the soft keys which are below and to the right of the display screen as shown overview in figure 3.03.
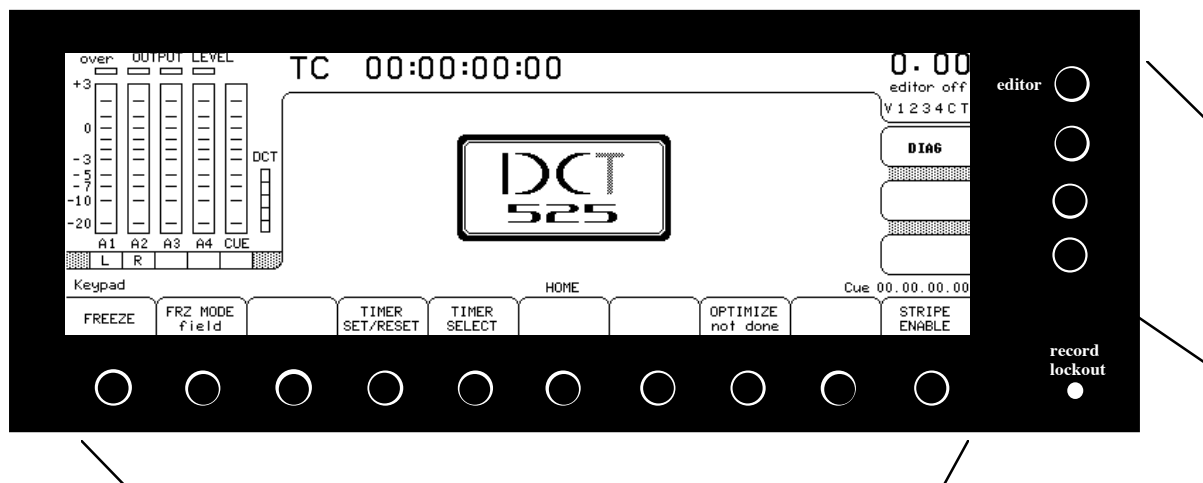
Figure 3.03 Display screen and Soft keys.

The above Figure 3.03, shows the relative positioning of the Softkeys and their respective windows. It is through the use of the Menu Select push-buttons, the Soft keys and their associated window panels that the operator can access all the operational functions of the DCT 1700d. Figure 3.04 below, gives the location of the various indicators and window functions of the LCD Display Screen.
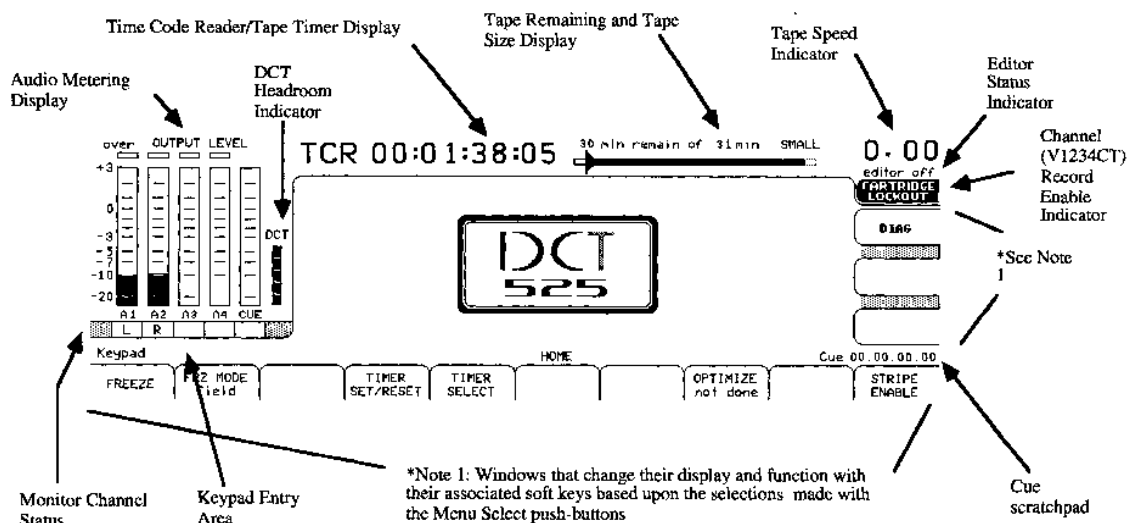
Figure 3.04 Showing the various parts of the Display LCD Screen

Numerical data entry is performed using the numerical keypad plus the *entry* and *exit* push-buttons shown below in figure 3.05. Refer to Figure 3.01 for the general positioning of the numerical keypad on the Control Panel.
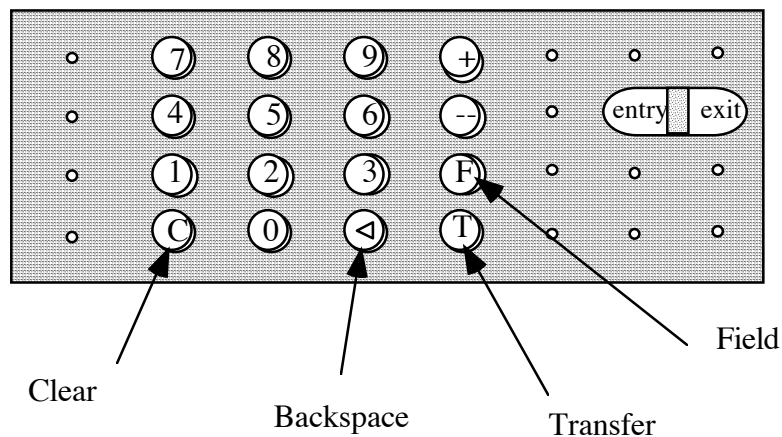
Figure 3.05 Numerical Keypad.

Transfer

Indicates Numerical Keypad value will be transferred to or from register
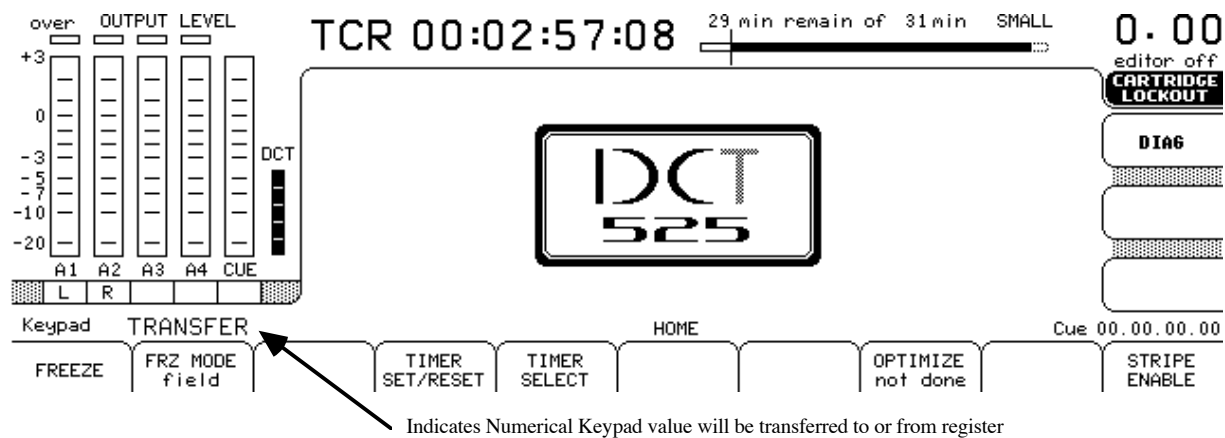
Figure 3.06 A partial display showing the Keypad TRANSFER

The above Figure 3.06 shows the screen as it is after pressing the *home* push-button, and the transfer (*T*) push-button has been pressed, which is indicated by the TRANSFER in the lower left corner of the display. Refer to Section 6 for function.

Clear

Indicates Keypad register has been cleared.
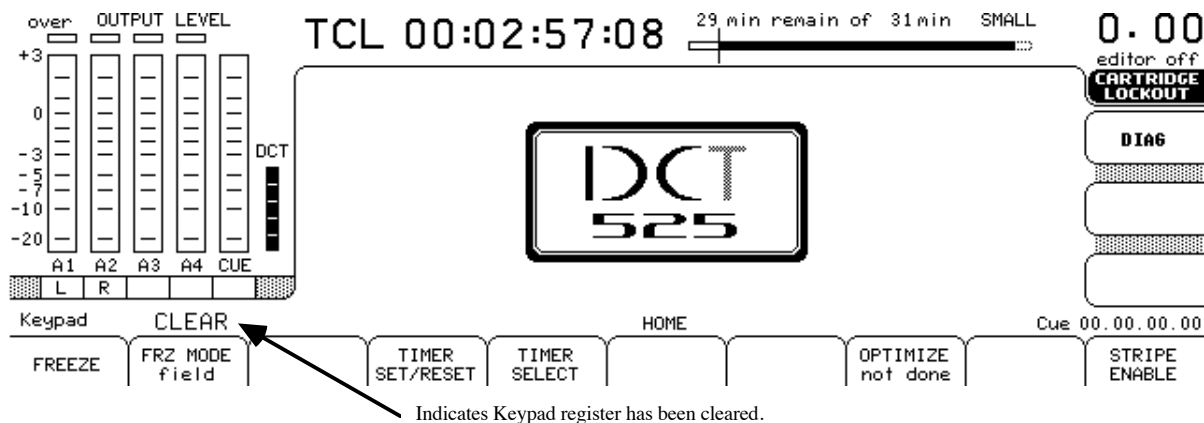
Figure 3.07 A partial display showing the Keypad CLEAR instruction.

The above Figure 3.07, shows the screen as it is after pressing the *home* push-button, and the clear (*C*) push-button has been pressed, which is indicated by the CLEAR in the lower left corner of the display. Refer to Section 6 for function.

3.1 Start-up Menus

3.1.1 Start-up

The below Figure 3.08, shows the Display screen as it is upon initial start-up, and shows machine serial number and software version number.
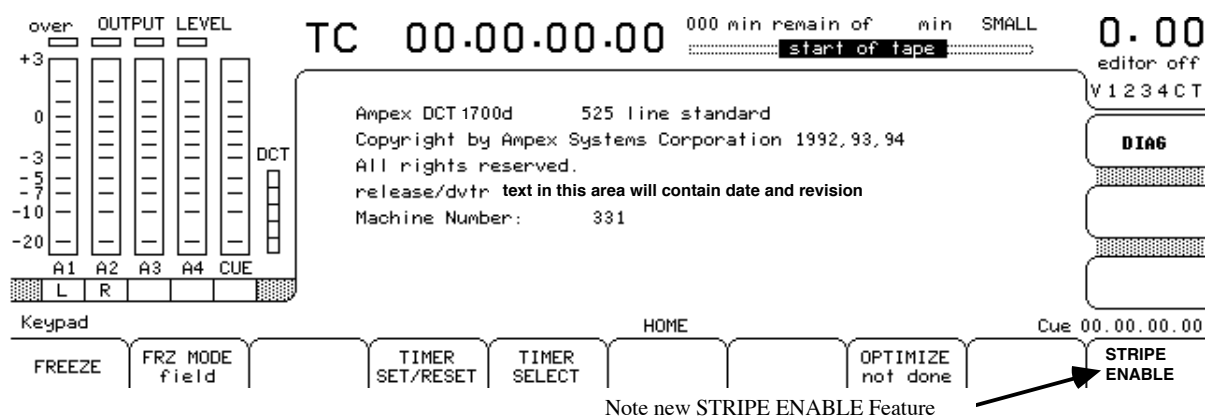
Figure 3.08 Start-up screen

3.1.2 Home Menu

It is followed by the screen seen in figure 3.09 when you press any other menu selection and then return to the home menu. The home menu is the first level of menu selection from which the following other parameters can be accessed, and is accessed by first pressing the *home* push-button in the Menu Select group of buttons; refer to Fig 3.02.
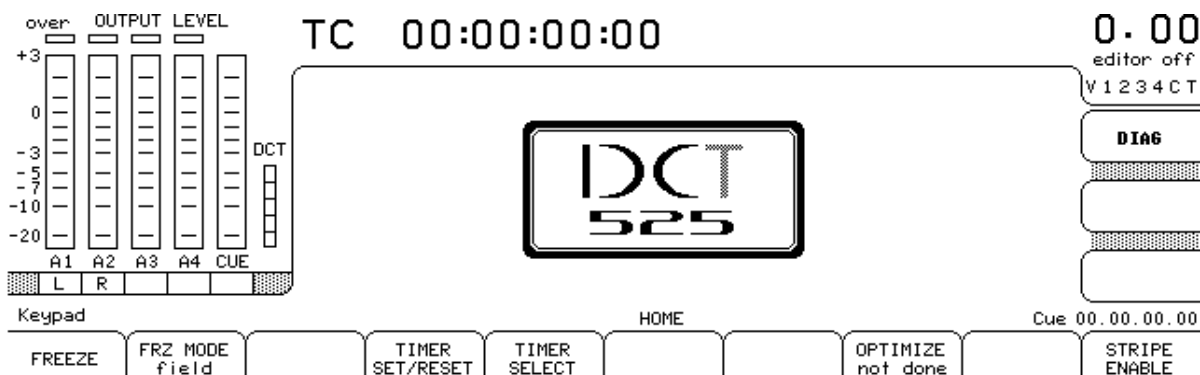
Figure 3.09 Home screen

3.1.3 Striping Menu

Figure 3.10 is the **HOME** screen from which you press the **STRIPE ENABLE** soft key to access the Striping function.
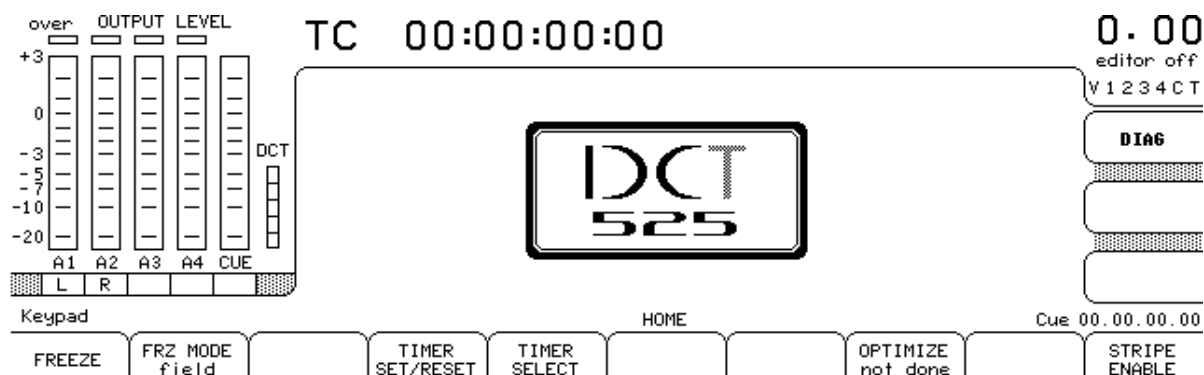
Figure 3.10 Home menu showing STRIPE ENABLE button

See section 3.7 SETUP, fig 3.21b for Striping **SETUP** screen, which allows the setup of the duration of both Black and Bars, the "Hour" (sometimes used as the reel indication) and the "Back Time".

Striping and subsequent Edit Optimization (Prior to editing on the tape) ensures the quality of a tape (because the operator can check the error concealment log for any problems), and will virtually eliminate any possibility of interchange problems experienced in the past with other formats.

More information on the Striping feature is available in sections 4 and 6, on pages 4-38, and 6-6.

3.2   Edit Menu

Editing Menus are accessed by first pressing the *edit* push-button in the Menu Select group
of buttons; refer to Fig 3.02.
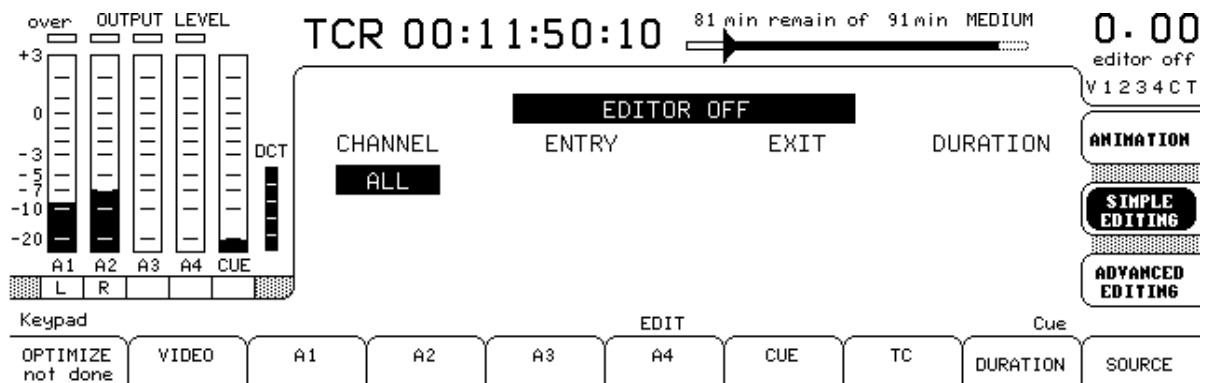
Figure 3.11 Editing screen

Figure 3.11 illustrates the initial editing screen which is the simple editing menu.

Refer to Section 6 for further information on editing.

3.3   Cueing

Cue Menus are accessed by first pressing the *cue* push-button in the Menu Select group of buttons; refer to Fig 3.02.

3.3.1   Cue Points
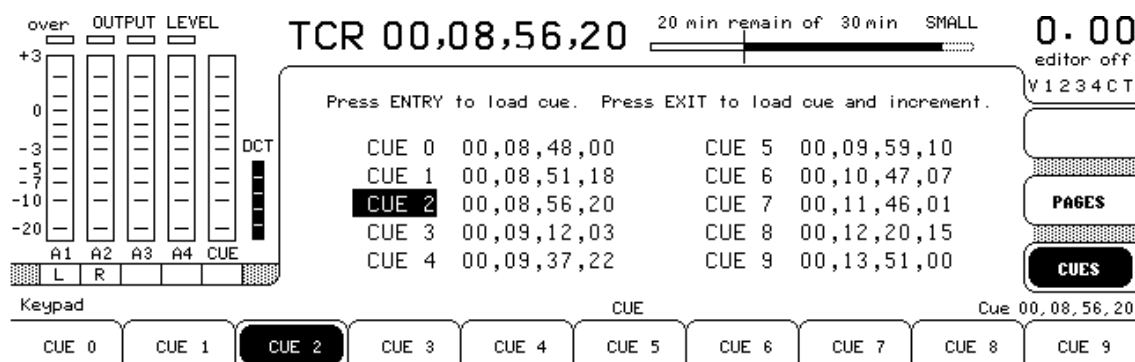
Figure 3.12 First Page of Cue points

Figure 3.12 shows the Display after CUES softkey has been pressed and as cue point number two has been selected, by pressing the CUE 2 soft key. There are additional cues points in other menu's available.
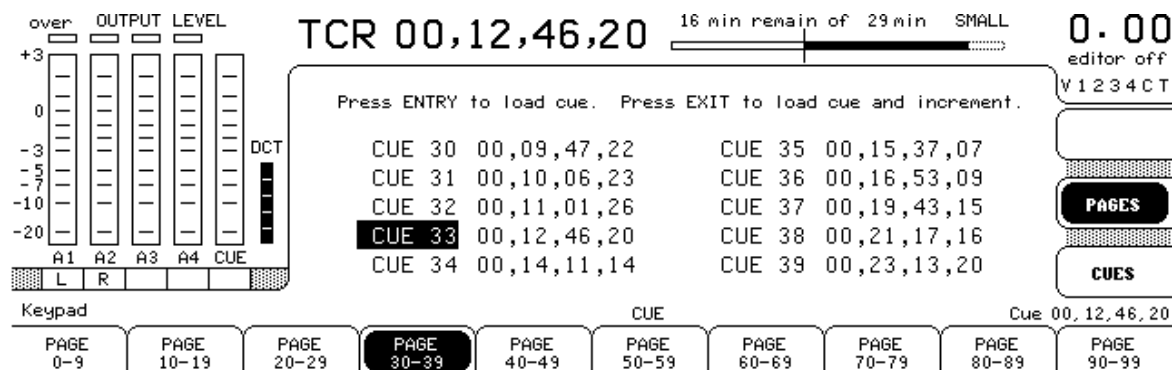
Figure 3.13 Second Page of Cue points

Please refer to Section 5.2.6 for further information on cue points and the method of accessing the other pages of cue points.

3.4   Status

Status Menus are accessed by first pressing the *status* push-button in the Menu Select group of buttons; refer to Fig 3.02.

Status Menu
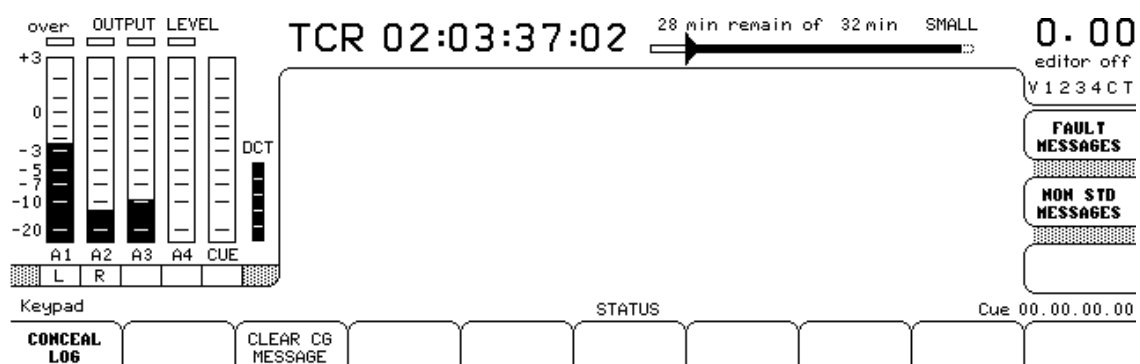
Figure 3.14 Entry menu to access Status

Figure 3.14 shows the screen after pressing the status push-button which allows access to the following sub menu Softkeys:

  FAULT MESSAGES

  NON STANDARD MESSAGES

3.4.1   Fault Condition

Note the Fault indicator
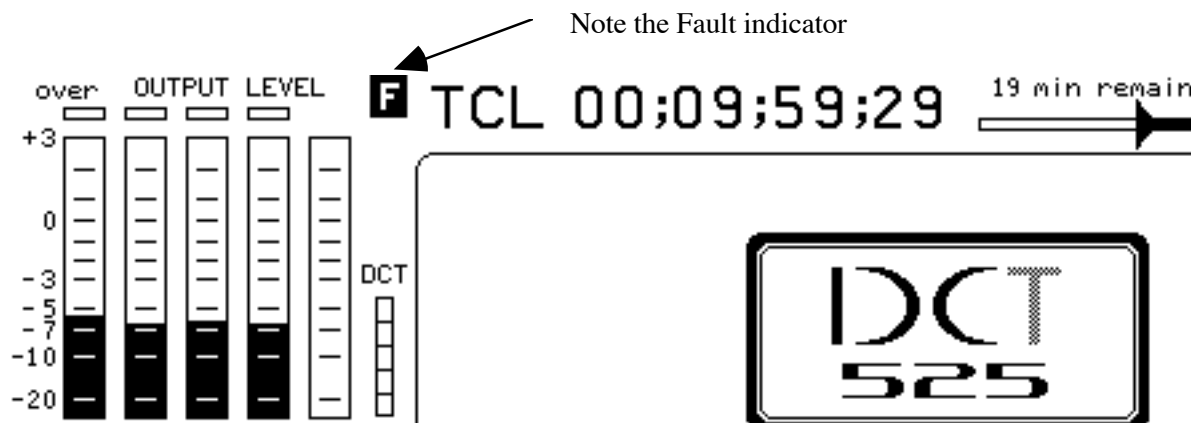
Figure 3.15 Fault Condition Indication

Figure 3.15 shows the Display screen where a fault condition is indicated. Press *status* to see the cause of the fault indication. Refer to section 7.5 for details.

3.4.2   Non Standard

Note the Non Standard indicator.
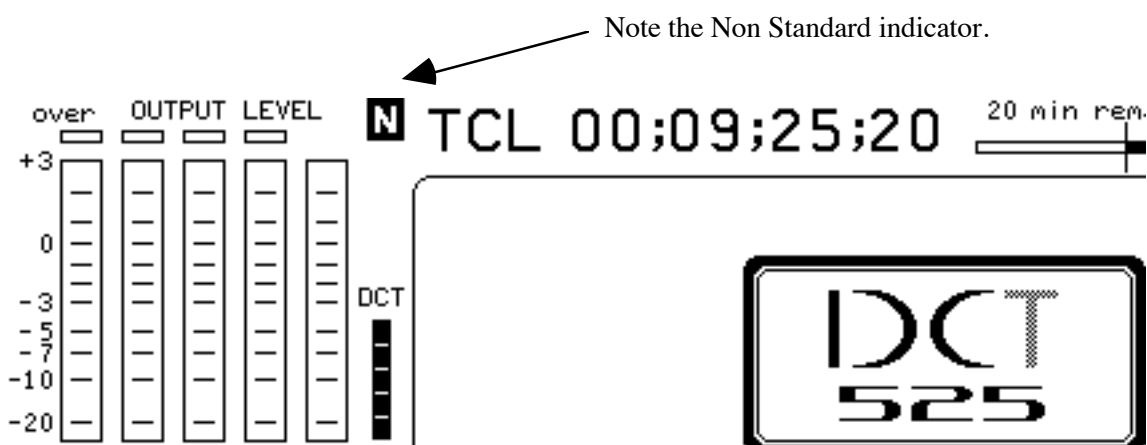
Figure 3.16 Non Standard Indication

Figure 3.16 shows the Display screen where a non standard condition is indicated. Press *status* to see the cause of the non standard indication. Refer to section 7.4 for details.

3.5   Timecode

All Timecode, Tape Timer related functions and selections are accessed by first pressing the *tc* push-button in the Menu Selection group of buttons. Tape time remaining and total tape record/play time for the loaded video cartridge appear in the bar graph in the upper right portion of the display screen.
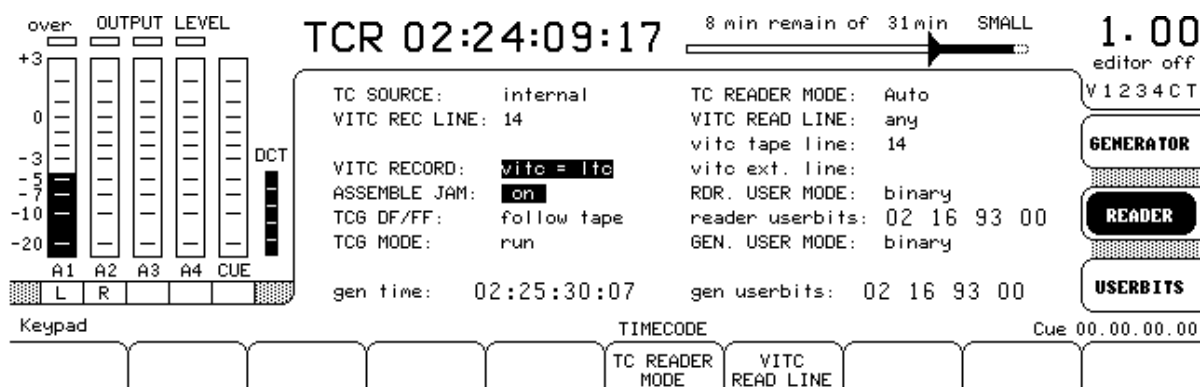
Figure 3.17 Time Code Reader

Figure 3.17 has the Timecode Reader (TCR) selected, and a tape has been inserted and shuttled to the time shown in the upper right hand portion of the display. The timecode reader is displaying the timecode of 2 Hours, 24 Minutes, 9 Seconds and 17 frames. See section 4.3 for more detail.
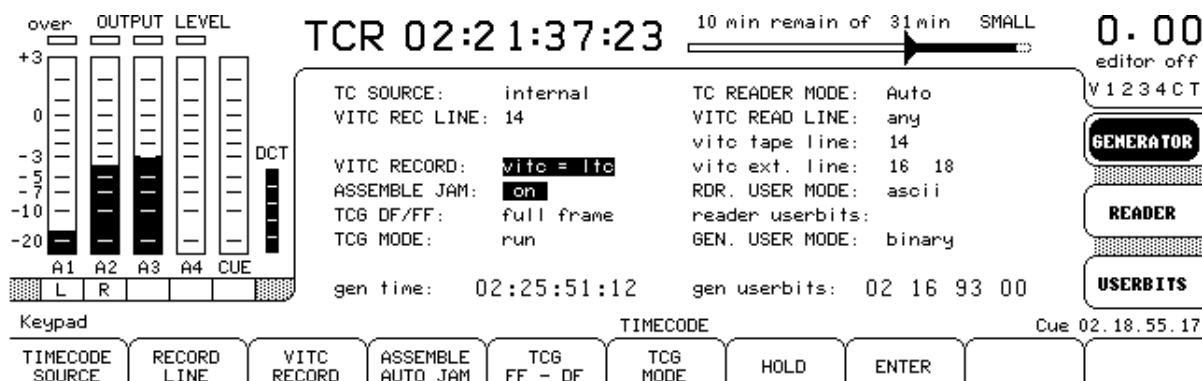
Figure 3.18 Time Code Generator

3.6   Monitoring

Monitoring Menus are accessed by first pressing the *mon* push-button in the Menu Select group of buttons; refer to Fig 3.02.
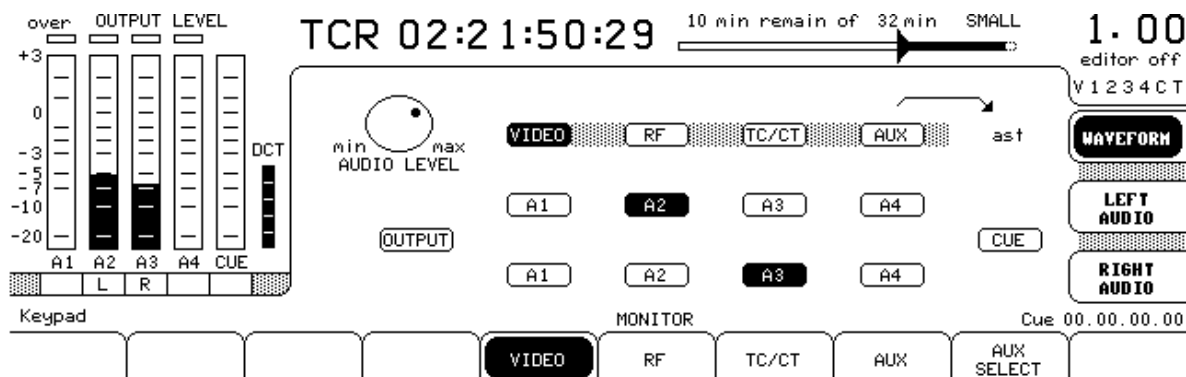
Figure 3.19

Figure 3.19 shows the screen after DIAG, WAVEFORM and VIDEO Softkeys have been pressed. This allows monitoring of a variety of signals.
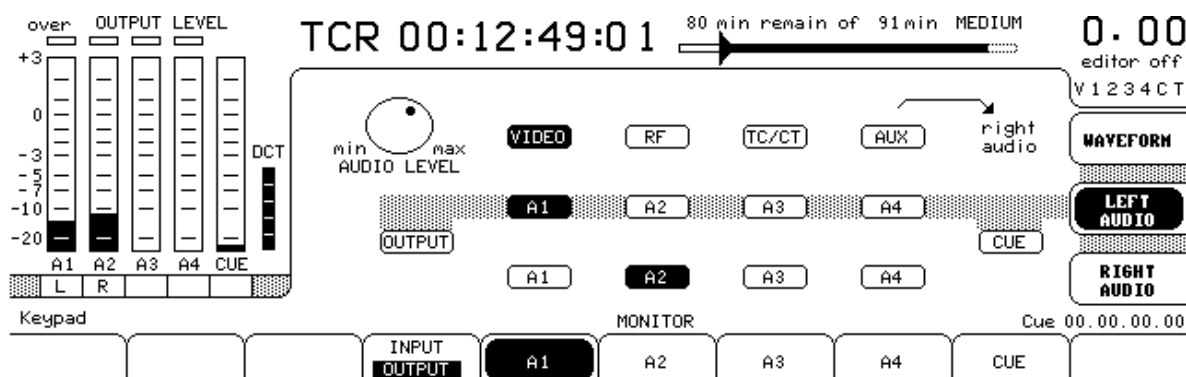
Figure 3.20

Fig 3.20 shows the screen after AUDIO softkey has been depressed. It can also be seen from figure 3.20 that the drive OUTPUT is being monitored, (INPUT being the other toggled selection), and the CUE channel has been selected to both the RIGHT and LEFT AUDIO monitor outputs.

3.7   Setup

Setup Menus are accessed by first pressing the *setup* push-button in the Menu Select group of buttons; refer to Fig 3.02.
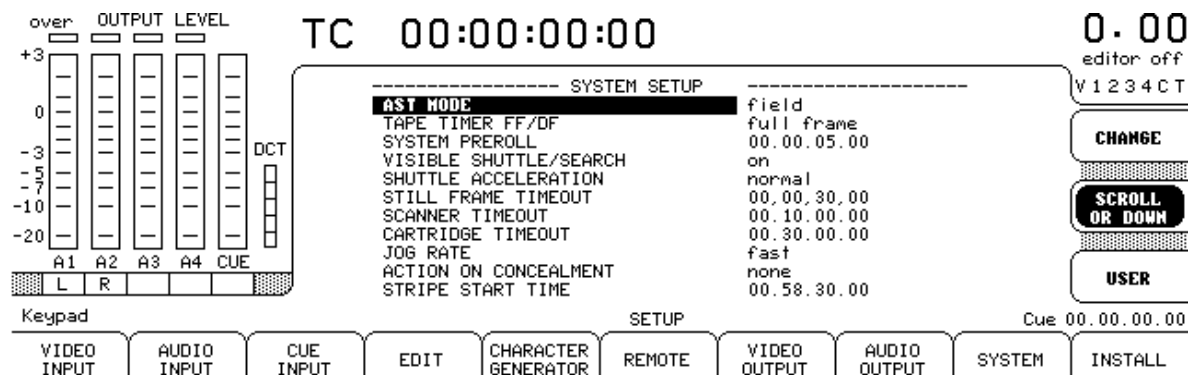
Figure 3.21a Initial Setup Screen.

Figure 3.21a. shows the screen as it is after pressing the *setup* push-button.
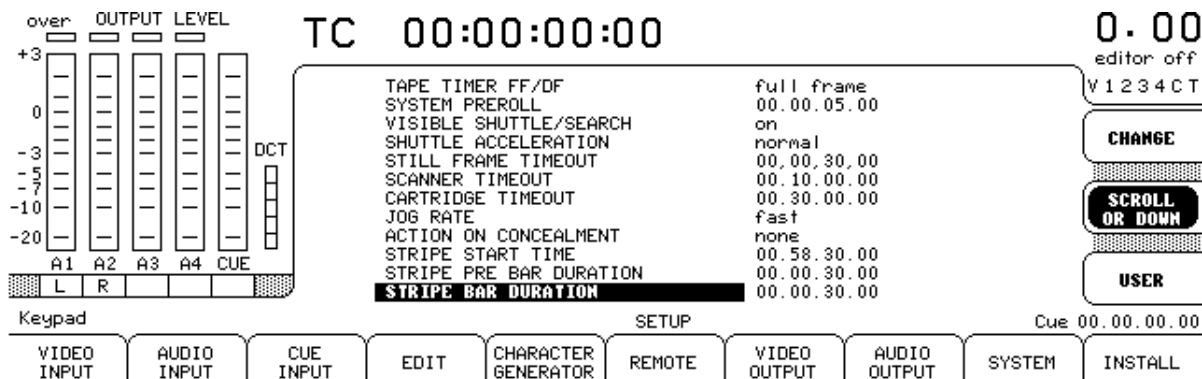
Figure 3.21b Prestripe Setup Screen.

Figure 3.21b. shows the screen as it is after pressing the *setup* push-button, and scrolling down (using the adjust knob) to set up prestripe duration.

3.8   Input Menu Selection

Input selection Menus are accessed by first pressing the *input* push-button in the Menu Select group of buttons; refer to Fig 3.02.

3.8.1   Input. Metering
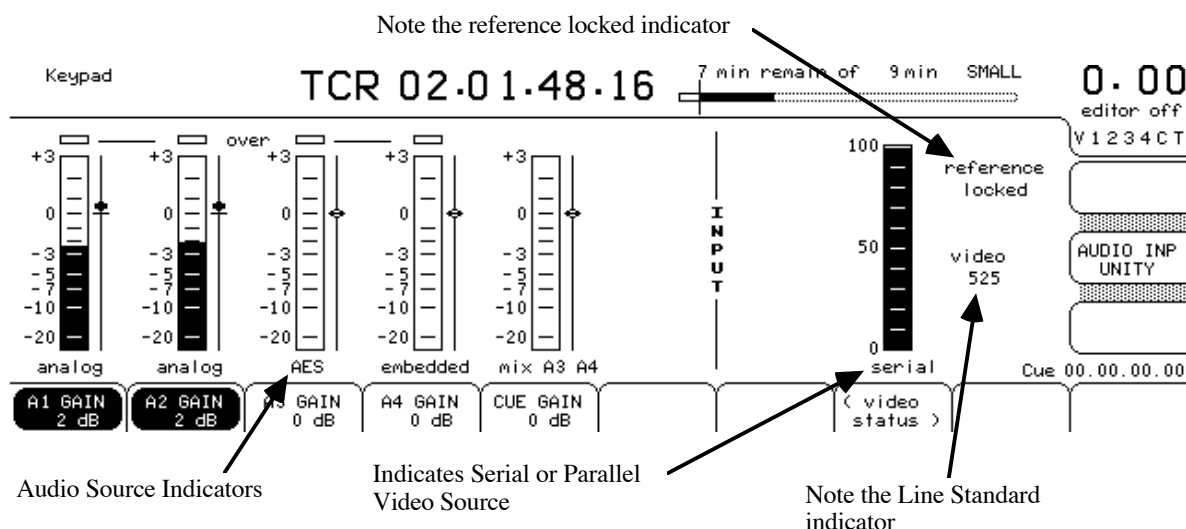
Figure 3.22 Input Level Selection made for VU meters.

Figure 3.22 shows the screen with an indication of a level of minus 2.5 dB shown on the Audio Channel 1 GAIN indicator, and minus 2dB on the A2 GAIN indicator. The levels under adjustment as indicated by the softkey label being high-lighted.

3.9 Output Menu Selection

Output selection Menus are accessed by first pressing the *output* push-button in the Menu Select group of buttons; refer to Fig 3.02.

3.9.1 Audio Output Metering
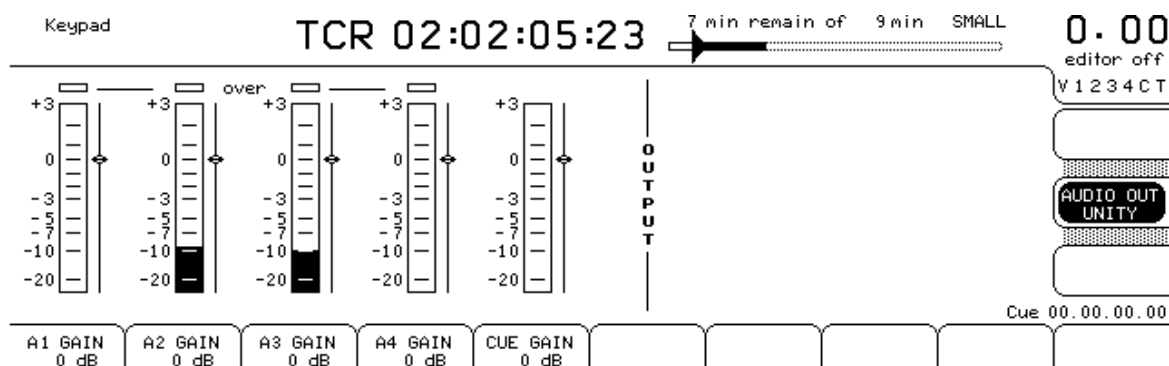
Figure 3.23a   Output Level Selection made for VU meters.

Figure 3.23a shows the screen displaying levels of audio for A2 GAIN and A3 GAIN, but, as they are not highlighted they are therefore not under adjustment.
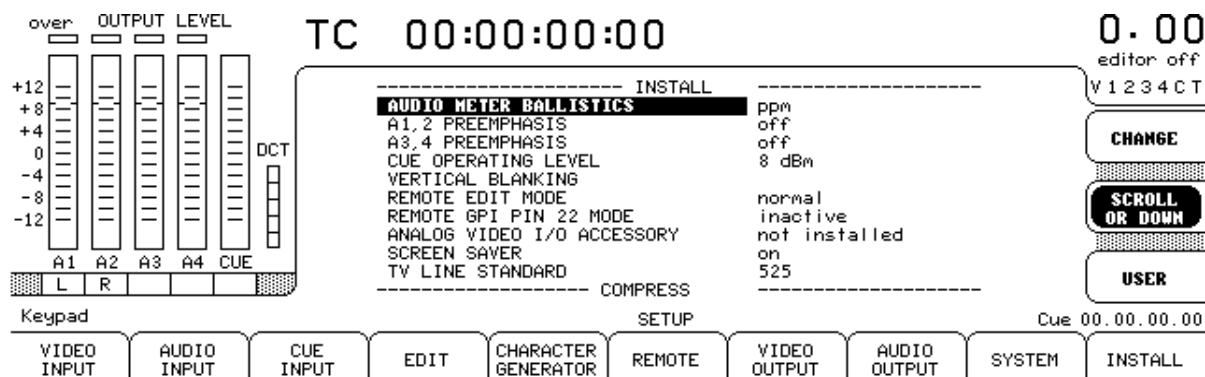
Figure 3.23b   Output Level Selection made for PPM meters.

Figure 3.23b shows the screen displaying levels of audio using the standard PPM meter. Other PPM screens are available for coarse PPM metering, fine range metering and a range offering a +20 scale, See section 4 page 4-40 for more detail.

AMPEX
DCT 1700d

Digital Component Tape Drive

Operation

SETUP / TIMECODE   4

Section 4
Setup

Section 4 provides detailed information on the setup procedures of the operating characteristics of the DCT 1700d. An in-depth description of each one of the setup selections is provided. Section 4 describes the setup menus and describes the setup and operation of the Time Code System.

Section 4 Setup

Section 4 Contents (continued)

Section 4 Contents (continued)

4.1 Video Tape Cartridge

The DCT 1700d handles small, medium, and large DCT® video cartridge sizes (defined in SMPTE Standard 226M). The drive can automatically load and thread any video cartridge in less than four seconds. Table 4.1 gives information on the recording time and dimensions of the DCT cartridges.

4.1.1   Specifications

Table 4.1 DCT Cartridge Specifications

Tape Specs

Video Tape Cartridge	Recording Time 525/625	Physical Dimensions L x W x D mm
DCT 10	13 minutes/11 minutes	172 x 109 x 33
DCT 30	33 minutes/29 minutes	172 x 109 x 33
DCT 35	38 minutes/35 minutes	254 x 150 x 33
DCT 60	72 minutes/64 minutes	254 x 150 x 33
DCT 90	95 minutes/85 minutes	254 x 150 x 33
DCT 100	112 minutes/100 minutes	366 x 206 x 33
DCT 120	138 minutes/124 minutes	366 x 206 x 33
DCT 200	210 minutes/189 minutes	366 x 206 x 33

4.1.2   Record Lockout

Each video cartridge include four holes which are designated "user" holes 1 through 4 in accordance with SMPTE Standard 226M. A cylindrical plug is mounted in a spring-loaded bayonet fashion in each hole. The top end of each user plug is slotted so that the plug can be turned by screwdriver. Thus, the plug can be adjusted and locked into either the upper (raised) or lowered position.
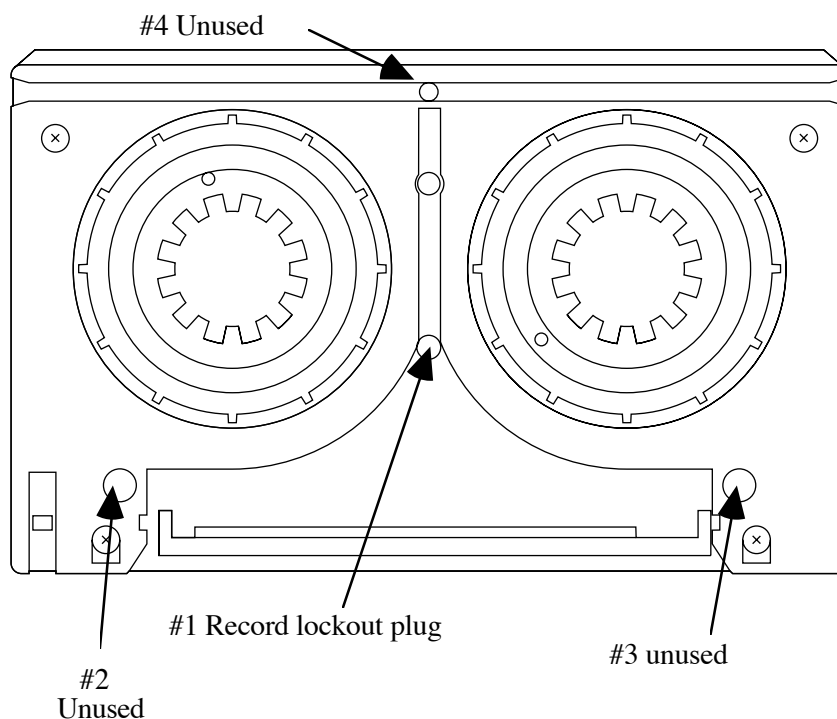
Figure 4.01 Lockout plugs

Table 4.2 DCT Cartridge Lockout Protection

User Plug 1	Cartridge Record Lockout Configuration
lowered	Total record enable
raised	Total record lockout

Cartridge Record Lockout

Turning plug in user hole 1 so that top of plug is flush with top of cartridge prevents all recording (total record lockout). Total recording is enabled when the plug in user hole 1 is turned 180° so that it is held in the lower bayonet connection (top of plug not flush with top of cartridge).
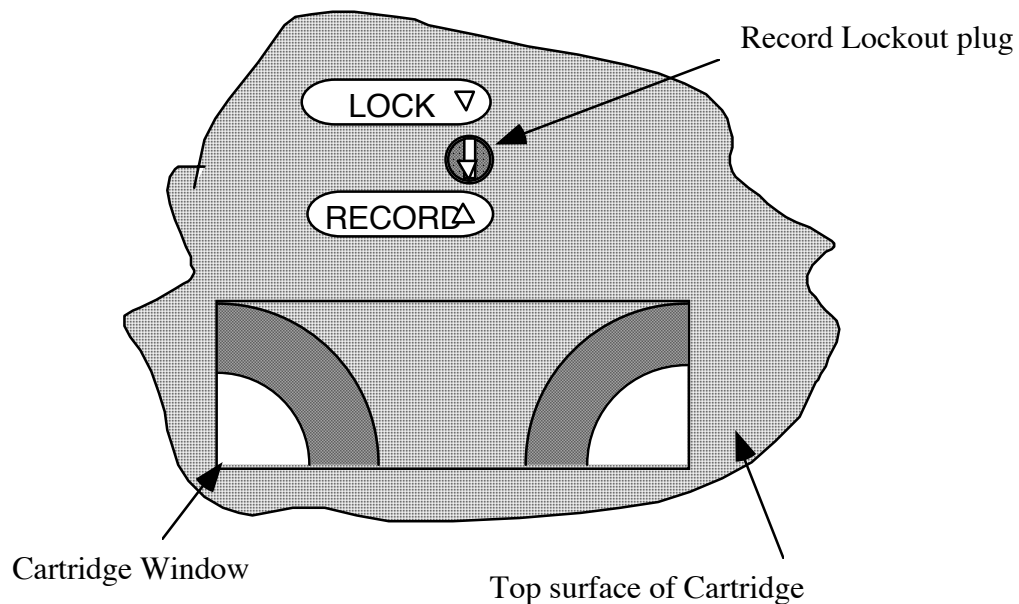
Figure 4.02 Record / Lock plug (plug #1)

To enable recording:

1. Insert screwdriver into slot of the plug in user hole 1.

2. Push down and rotate plug in user hole to lowered position.

To lock out recording:

1. Insert screwdriver into slot of plug in user hole 1.

2. Push down and rotate plug in user hole.

3. Release downward pressure and allow spring-loaded plug to rise until flush with top of cartridge.

4. Load cartridge in drive and note the following message on the control panel display:

CARTRIDGE LOCKOUT

Note: *The record lockout LED is on.*

CAUTION: Plug in user hole 2, 3, & 4 may be rotated as in Fig 4.03, so that the plug is completely free of its bayonet connections. It may, therefore, fall out of the cartridge and lodge somewhere in the DCT 1700d transport mechanisms. Ensure plugs are set properly, before loading cartridge into the drive.

Rotatable Plugs 2, 3 or 4. # 3 shown

Body of the Cartridge

Note small protrusions on the case

Tape protection door
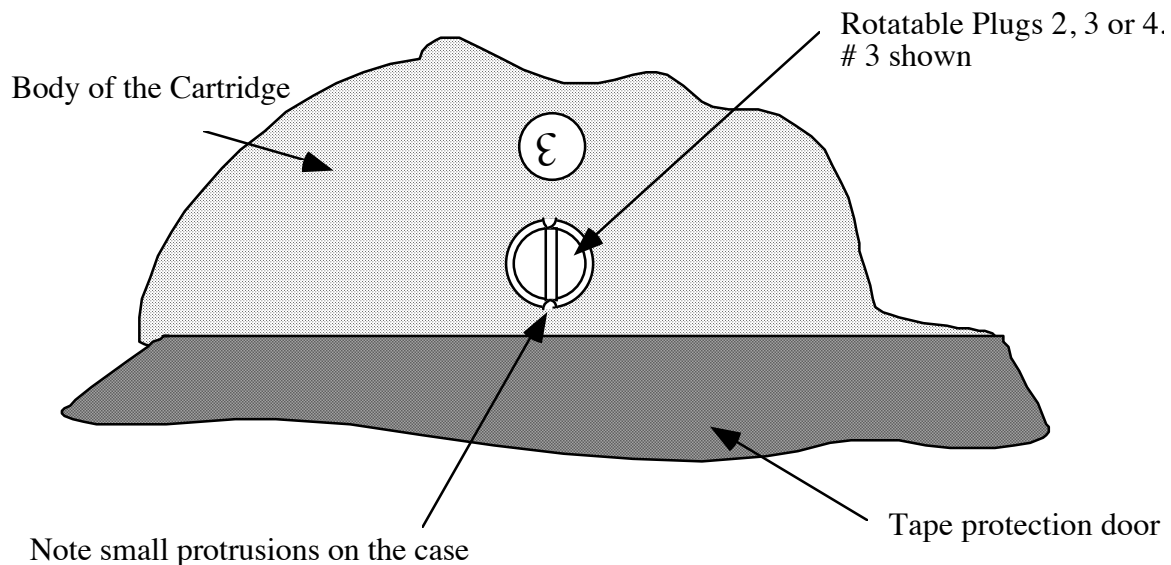
Fig 4.03 Plug Rotated in User Hole to Removable Position

Note: *Figure 4.03 shows the user removable plug in the position in which it can be removed, under normal circumstances this is not something one would want to do. It is however possible to arrive in this position while adjusting the plug from the raised to the lowered positions or vice versa. Ensure that it is not in this position before inserting in the DCT 1700d.*

Note: *Total record lockout can also be achieved by setting master record enable/lockout switch to the lockout (right-hand) position. This toggle switch is located on the lower right front of the drive behind the control panel . When this switch is in the lockout position, the following message appears on the control panel display:*

MASTER LOCKOUT

Note: *The record lockout LED is **on**.*

Note: *Refer back to Section 2.11.3 for visual representation of the location of the Master lockout switch.*

4.2 Power-up and Video Cartridge Loading and Unloading

Install and cable all video equipment before powering up system.

Power up system and load video cartridge as follows :

1. Toggle the POWER switch to the **on** position. POWER switch indicator lights and drive initializes itself (approximately 30 seconds). The Home menu appears when initialization completes. The **STOP** push-button is dim.

2. If necessary, set video cartridge to desired record lockout mode .

3. Push video cartridge into compartment horizontally with label side up. For small and medium size cartridges, locate video cartridge at center of compartment and push in horizontally.

Note: *Video cartridge size is automatically detected and loading starts immediately. When loading is complete, STOP button/indicator lights.*

4. After operation, eject video cartridge. The video cartridge can be ejected in two ways:

    a. Press the **eject** button to eject video cartridge at the present tape position.

    b. Press **STOP** and **SHUTTLE** buttons simultaneously to rewind the tape to the start of tape and eject video cartridge.

Power-up and loading

4.3 Tape Time and Timecode Reader

Tape time or timecode reader data appear in the upper left corner of display screen. See Figure 4.04 below. The selection made is indicated by the TCR (Timecode Reader), and the display in our example is showing 3 minutes, 40 seconds and one frame.

Tape Remaining Indicator

Tape time remaining and total tape record/play time for the loaded video cartridge appear in the bar graph in the upper right portion of the display screen, as shown below. The "Time Remaining" indicator will show the length of tape in use and how much has already been used. It can be seen in our example below that we have used three minutes of this tape.
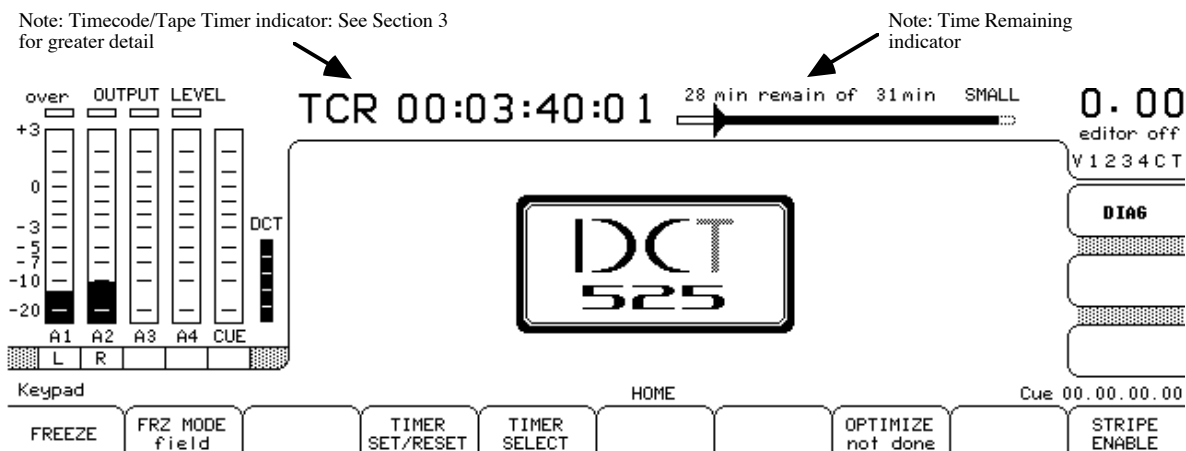
Figure 4.04 Showing both the Timecode indicator and the Tape Remaining indicator.

> *Note:* *The normal operation is such that the DCT 1700d must move the tape in one direction or another for it to assess how much tape is in the type of cartridge in use. It is therefore normal to have an incorrect indication for a short period of time immediately after cartridge insertion.*

4.3.1   Selecting Time Data Source Display

From the *home* menu press TIMER SELECT soft key repeatedly to select the following tape time source:

Timecode reader data visible on the screen may indicate one of the following:

TC :   TIMECODE is faulty or missing from tape.

TCR: BOTH   VERTICAL   AND   LONGITUDINAL TIMECODE are present and identical.

TCV: VERTICAL   INTERVAL   TIMECODE   (VITC), selected and present.

TCL: LONGITUDINAL   TIMECODE   (LTC),   selected and present.

TCX: VITC AND LTC are present but are not identical

TT1:   TAPE TIMER 1 data by frame unit.

TT2:   TAPE TIMER 2 data by frame unit.

UB: USER BITS are faulty or missing from tape

UBR: VERTICAL   and   LONGITUDINAL   USER   BITS are present and identical.

UBV: VERTICAL   INTERVAL   USER   BITS,   selected and present.

UBL: LONGITUDINAL   USER   BITS,   selected   and present.

UBX: LONGITUDINAL   and   VERTICAL   INTERVAL USER BITS are present but are not identical

Resetting Tape Timers

TT1 (Tape timer 1) and **TT2** (tape timer 2) can be reset to zero to provide the cue for cue-to-air operation. To reset the timers to 00;00;00;00, press TIME hard key to select **TT1** or **TT2** then press TIME SET hard key. Timer will count from 00;00;00;00 when tape rolls.

Setting Tape Timers to Preset Value

To set TT1 or TT2 tape timer to a preset value:

1. Enter desired time into temporary keypad register using numeric keypad.

   When entering time, keep in mind that the last two digits entered are frames. This number must be between 00 and 29 (00 and 24 for 625). Any value greater than 29 (24 for 625) generates an error message indicated by an asterisk (*) between the numbers.

   Minutes or seconds greater than 59 and hours greater than 23 also generate the same error message.

Note 1: *If hours, minutes, and seconds are blank, keypad entries of 0–99 frames are allowed and converted to seconds and frames.*

Note 2: *When a cartridge is inserted, TT2 will automatically zero at the start of tape.*

2. Press TIMER SELECT hard key to select **TT1** or **TT2**.

3. Press TIMER SET hard key to transfer time indicated in keypad register to timer display. Time counts from entered value when tape rolls.

4.3.2 Selecting Tape Time Mode (525)

DCT 1700d Component Digital Tape Drives have three tape time modes:

- Full-frame tape time mode displays tape times with colons or periods as time unit separators. Example:

  23:59:59:00 (even field)   **23.59.59.00** (odd field)

- Drop-frame tape time mode displays tape time with semi-colons or commas as time unit separators. Example:

  23;59;59;00 (even field)   **23,59,59,00** (odd field)

- Invalid mode displays tape times with asterisks as time unit separators. Example:

  23*59*59*00 (all fields)

The various time unit separators used in both full- and drop-frame modes.

Table 4.3 Time Unit Separators

Tape Time Mode	Odd Field	Even Field
Full Frame	.	:
Drop Frame	,	;
Calculated	_	_
Invalid	*	*

4.4 Setup Menus

The following setup menus are reached by pressing the *setup* push-button and then pressing the desired menu soft key. See figure 4.05 below.
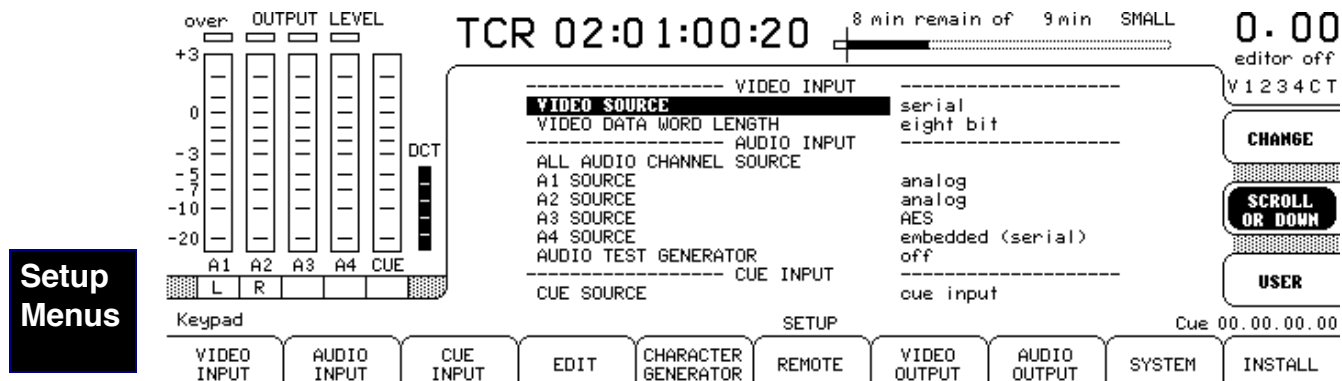
Figure 4.05

4.4.1   Setting Video input

Video Input Source Selections

VIDEO SOURCE

parallel

serial

(RGB, Y/B-Y/R-Y, or Beta (if the analog video I/O accessory is installed.)

Video Input Data Word Length Selections

VIDEO DATA WORD LENGTH

eight bit

ten bit

Note: The selection sets the video input data word length to either 8 bit or 10 bits.

4.4.2 Setting Audio input

Refer to figure 4.05

Audio Input Source Selections

ALL AUDIO CHANNEL SOURCE

Selects input source for all audio channels simultaneously

A1 SOURCE

analog

AES

embedded (serial)*

embedded (parallel)*

*Note: Either serial or parallel embedded will be displayed, depending on the Video Input selection.

A2 SOURCE

analog

AES

embedded (serial)*

embedded (parallel)*

*Note: Either serial or parallel embedded will be displayed, depending on the Video Input selection.

A3 SOURCE

analog

AES

embedded (serial)*

embedded (parallel)*

*Note: Either serial or parallel embedded will be displayed, depending on the Video Input selection.

A4 SOURCE

　analog

　AES

　embedded (serial)*

　embedded (parallel)*

Note:　　*Either serial or parallel embedded will be displayed, depending on the Video Input selection.*

Audio test generator

AUDIO TEST GENERATOR

　on

　off

Audio mute edit flags

AUDIO MUTE EDIT FLAGS

　record disabled.

　record

4.4.3   Setting Cue Input
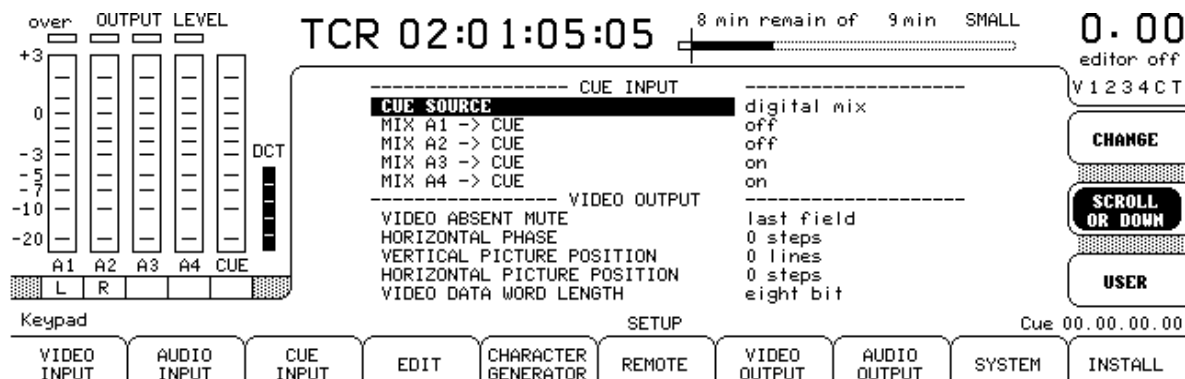
Figure 4.06 Cue Setup

Cue Input Source Selections

CUE SOURCE

cue input   (from rear panel XLR connector)

digital mix   (from primary A1-A4 sources)

Mix A1 -> cue

off

on

Mix A2-> cue

off

on

MIX A3-> CUE

off

on

Mix A4-> cue

off

on

4.4.4   Setting Edit Setup


```
over  OUTPUT LEVEL    TCR 02:01:05:05    8 min remain of   9 min   SMALL    0.00
+3                                                                          editor off
                                                                          V 1234CT
 0
                  DCT      ------------------ EDIT SETUP ------------------
-3                         ANIMATION PREROLL            00.00.01.00          CHANGE
-5                         EDIT PREROLL                 00.00.05.00
-7                         EDIT POSTROLL                00.00.01.00
-10                        AUTO TAG                     on                  SCROLL
-20                        INS/ASM PREROLL AUTO OPTIMIZE off                OR DOWN
                           ----- CHARACTER GENERATOR SETUP -----------------
 A1 A2 A3 A4 CUE           CHAR DISPLAY MODE            time
  L  R                     CHAR DISPLAY SELECT          tape timer
                           CHAR STATUS LINE             on                  USER
                           CHAR BACKGROUND              off
                           CHAR COLOR                   white
Keypad                                      SETUP              Cue 00.00.00.00
 VIDEO    AUDIO    CUE    EDIT  CHARACTER  REMOTE  VIDEO   AUDIO  SYSTEM  INSTALL
 INPUT    INPUT   INPUT         GENERATOR          OUTPUT  OUTPUT
```

Edit Setup

Figure 4.07 Edit Setup

Animation preroll Selections

ANIMATION PREROLL

> Enter time into temporary keypad register using numeric keypad. Time can be entered as hours, minutes, seconds or frames, similar to entering tape time or timecode numbers.

> Scroll to ANIMATION PREROLL   Enter the number (hours, min., sec, frames) with keypad and press **CHANGE.**

Edit preroll Selections

EDIT PREROLL

> Enter time into temporary keypad register using numeric keypad. Time can be entered as frames, seconds, or minutes similar to entering tape time or timecode numbers.

> Scroll to EDIT PREROLL. Enter the number (hours, min., sec, frames) with keypad and press **CHANGE.**

Edit Postroll Selections

EDIT POSTROLL

> Enter time into temporary keypad register using numeric keypad. Time can be entered as frames, seconds, or minutes similar to entering tape time or timecode numbers.

> Scroll to EDIT POSTROLL. Enter the number (hours, min., sec, frames) with keypad and press **CHANGE.**

Insert Assemble Preroll Auto Optimization Selections

INS/ASM PREROLL AUTO OPTIMIZE

> on

> off

Note: *Performs edit optimize every time* ***PLAY*** *is requested with the editor on, such as during a preroll to an edit. Requires a 5 second preroll. This is normally only used when the tape to be edited has been prepared using several different drives, such as might be the case with a film to tape transfer that is then posted at a second facility and may have special effects added by a third facility.*

4.4.5   Character Generator Setup
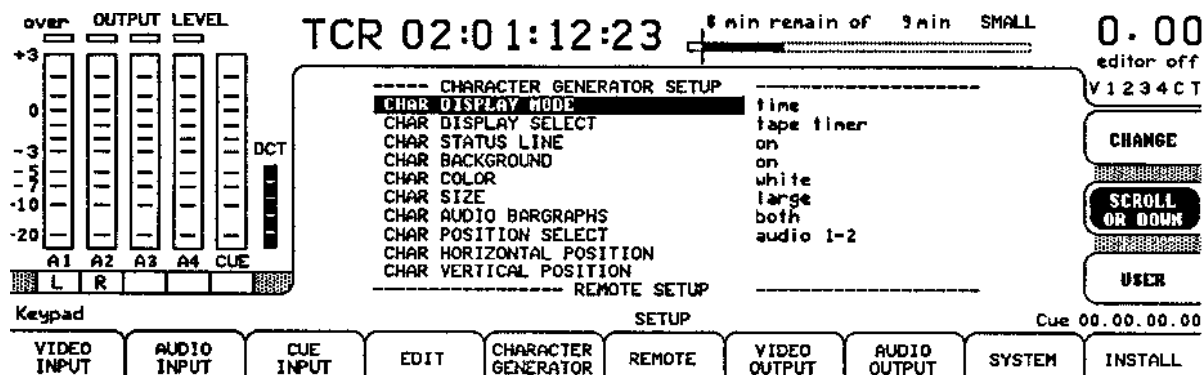
Figure 4.08 Character Generator Setup

CG Setup

The character generator displays tape time, timecode, and user bit characters on the picture monitor. Audio bar graphs can also be displayed for remote audio monitoring. Press **CHARACTER GENERATOR** soft key in the setup menu, to select Character Generator Setup menu.

Pressing the **CHANGE** soft key repeatedly will cycle through the following selections:

Character Display Mode Selections

CHAR DISPLAY MODE

off: No display

time: Data from timecode reader or tape time data as selected in the *home* menu.

user: Data from user bit reader .

tcr and user: Data from the timecode reader & user bits.

tcg and user: Data from the timecode generator & user bits.

Note: When the time and user display selections are in the small character mode the DCT meter will not be displayed.

Character Display Selections

Pressing the **CHANGE** soft key repeatedly will cycle through the following selections:

Selections with TIME selected in the character display mode.

CHAR DISPLAY SELECT

tape timer:	Display Tape Timer information as selected in the *home* menu.
tcr:	Displays timecode reader time.
tcg:	Displays timecode generator time.
all:	Displays timecode reader, timecode generator (or external if selected), longitudinal timecode reader, vertical timecode reader, raw longitudinal timecode reader, and raw vertical timecode reader time.

Selections with USER selected in the character display mode.

tcr user:	Display format determined in the TC mode.
tcg user:	Display format determined in the TC mode.

Status Line Selections

CHAR STATUS LINE

on	Freeze, Transport and E/E modes (if active), tape speed, fault & non std messages and the DCT meter, are indicated in the character generator status display.
off	Status is not displayed

Note: *STATUS LINE is not displayed when DISPLAY SELECT is in all mode.*

Character Background Selections

CHAR BACKGROUND

on: Places a box around the character display for better visibility.

off   Displays normal dark characters on a lighter background.

Character Color Selections

CHAR COLOR

black: Black characters on white background.

white: White characters on black background.

Character Size Selections

CHAR SIZE

small: Displays small characters.

large: Displays large characters.

Note: *__SIZE__ soft key is not active when __DISPLAY SELECT__ soft key is in __all__ mode. When the Status Line is on, the small mode will not display e/e, freeze status. Non standard and fault conditions will be located in the speed area by the NST or FLT indicators.*

Audio Bar Graphs Selections

CHAR AUDIO BAR GRAPHS

off: Bargraphs off

Audio 1 & 2:   Displays A1 and A2

Audio 3 & 4:   Displays A3 and A3

Both: Displays all channels.

Character position select

CHAR POSITION SELECT

Characters: Positions Timecode and user bits on the screen.

Audio 1 and 2:   Positions Audio 1 & 2 on the screen

Audio 3 and 4:   Positions Audio 3 & 4 on the screen

Positioning Characters on Monitor

CHAR HORIZONTAL POSITION

Press **CHANGE** button and adjust with adjust knob

Note: *After positioning characters, press **CHANGE** soft key to remove highlight.*

CHAR VERTICAL POSITION

Press **CHANGE** button and adjust with adjust knob

Note: *After positioning characters, press **CHANGE** soft key to remove highlight.*

Remote Setup

4.4.6   Remote setup selections
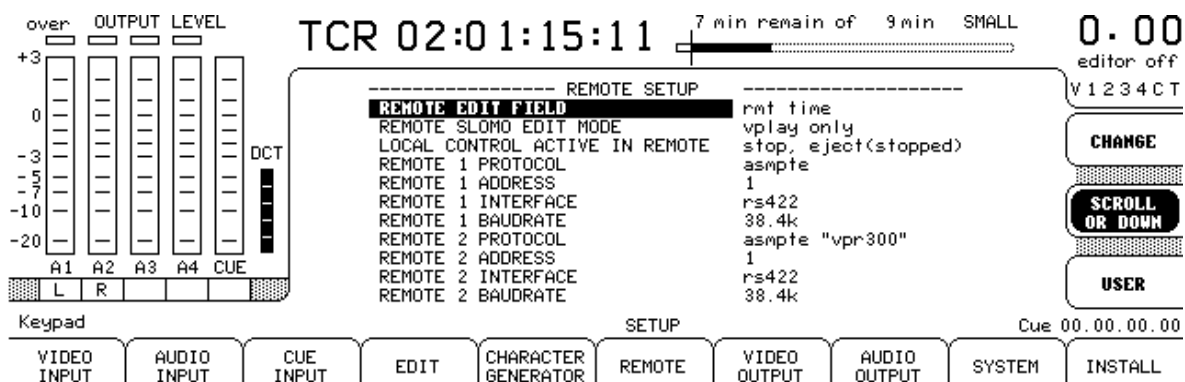
Figure 4.09 Remote Setup

The drive can be controlled from another location by means of a computerized editing system. The following paragraphs describe various remote control functions.

Status information from the remote ports is available when the drive is in local mode, if remote control communications previously were established.

The following procedure sets up REMOTE 1 and REMOTE 2 ports for remote control serial communications between the drive and other drives or control systems.

Remote Edit Field Selections

REMOTE EDIT FIELD

field 1   (drive will perform f1 dominant edits)

field 2   (drive will perform f2 dominant edits.

rmt time   (controlled by serial port) (drive will edit on the
                           field requested by controlling device)

*Note: Also determines the first displayed field of a pair when
            AST = Frame*

Remote Slo-mo Edit Mode Selections

REMOTE SLOMO EDIT MODE

vplay only   (editor control of slo-motion speeds only),

tso/vplay   (editor control of both tape speed override and
                           slo-motion control).

*Note: While in the tso/vplay mode the drive will remain in the
            tso mode between 90% and 110% of play speed. All
            other speeds will revert to slo-mo mode.*

The functionality of the front panel transport motion controls can be restricted whenever the drive is in the remote mode. The functionality is accessed in the following manner.

Local Control Active In Remote Selections

LOCAL CONTROL ACTIVE IN REMOTE

none: No front panel controls are active.

stop, eject (stopped)   Only the **STOP** and EJECT (after stop,) front panel controls are active.

all: All front panel controls (other than record) are active.

Remote 1 Protocol Selections

REMOTE 1 PROTOCOL

asmpte: (ACE SMPTE) for Ampex family of ACE editing and other compatible systems, Ampex one-inch and D-2 drives, and compatible equipment; Optimized for DCT 1700d tape drive.

asmpte "vpr 300"   The DCT 1700d emulates a VPR-300.

sony: Sony protocol optimized for DCT 1700d.

sony "2100":   DCT 1700d emulates a Sony 2100 series D1 recorder.

betachase: Slaves Sony protocol drive to the DCT 1700d .

Note: *Remote protocol also determines protocol for source vtr in 2 machine standup editing. See edit section 6.*

Remote 1 Address Selections

REMOTE 1 ADDRESS

Use the numeric keypad to load address between 0 and 8176 into address register. The Default is zero (0). ASMPTE only.

Remote 1 Interface Selections

REMOTE 1 INTERFACE

rs422:	EIA serial interface standard at RS-422 connector.
rs232:	EIA serial interface standard at RS-232 connector.

Remote 1 Baud Rate Selections

REMOTE 1 BAUD RATE

38.4k

1200

9600.

Remote 2 Protocol Selections

REMOTE 2 PROTOCOL

asmpte:	(ACE SMPTE) for Ampex family of ACE editing and other compatible systems, Ampex one-inch and D-2 drives, and compatible equipment; Optimized for DCT 1700d tape drive.
asmpte "vpr 300"	The DCT 1700d emulates a VPR-300.
sony:	Sony protocol optimized for DCT 1700d.
sony "2100":	DCT 1700d emulates a Sony 2100 series D1 recorder.
betachase:	Slaves Sony protocol drive to the DCT 1700d .

Remote 2 Address Selections

REMOTE 2 ADDRESS

Use the numeric keypad to load address between 0 and 8176 into address register. The Default is zero (0). ASMPTE only.

Remote 2 Interface Selections

REMOTE 2 INTERFACE

rs422:	EIA serial interface standard at RS-422 connector.
rs232:	EIA serial interface standard at RS-232 connector.

Remote 2 Baud Rate Selections

REMOTE 2 BAUD RATE

38.4k

1200

9600.

Serial Record Real Time Offset Selections

SERIAL RECORD REAL TIME OFFSET

+4 to -4	Press **CHANGE** button and change with keypad (maximum of 4 frames).

Note: *The timecode reported to the serial port may differ from the actual timecode necessary to synchronize edits with some controllers. This mode is typically used in operations where partial synchronization is accomplished by the use of this offset.*

Serial Playback Real Time Offset Selections

SERIAL PLAYBACK REAL TIME OFFSET

+4 to -4	Press **CHANGE** button and change with keypad (maximum of 4 frames)

Note: *The timecode reported to the serial port may be offset for proper synchronization with some controllers.*

ACE SMPTE Immediate Roll Response Selections

ACE SMPTE IMM ROLL RESPONSE

    sync   (starts a clock synchronous to the roll command and synchronizes drive to internal clock),

    play   (drive rolls with the roll command and lets the editing system do the synchronization)

Immediate Roll Sync (play) Offset Selections

IMMEDIATE ROLL SYNC(PLAY) OFFSET

    +4 to -4   Press **CHANGE** button and change with keypad. This adjusts synchronization in the immediate command mode

Beta chase Source Advance Selections

BETA CHASE SOURCE ADVANCE

    +4 to -4   Press **CHANGE** button and change with keypad. This adjusts synchronization of the betacam (or other vtr or drive that is chasing the DCT drive) in beta chase mode.

4.4.7 Setting Video output selections

Figure 4.10 Video Output Setup

Video Absent Output Mute Selections

VIDEO ABSENT MUTE

Last field

Last field/ee

black

Note: *This determines the picture displayed on the video output when the tape unthreads from the scanner or plays into an area of no rf, ie; blank or erased tape.*

Horizontal Phase Selections

HORIZONTAL PHASE

Press **CHANGE** button and change with adjust knob

Note: *A range of -858 to +858 steps is available. This parameter is not reset to zero when the tape is ejected.*

Vertical Picture Position Selections

VERTICAL PICTURE POSITION

Press **CHANGE** button and change with adjust knob

Note: *A range of -30 lines to + 30 lines is available, and is reset when the tape is ejected.*

Horizontal Picture Position Selections

HORIZONTAL PICTURE POSITION

Press **CHANGE** button and change with the adjust knob

Note: *A range of -41 to +41 picture elements is available. (720 picture elements per line), and is reset when the tape is ejected.*

Video Output Data Word Length Selections

VIDEO DATA WORD LENGTH

eight bit

ten bit

Note: *Sets the video output data word length to either 8 bit or 10 bits.*

Full Field Concealment Selections

FULL FIELD CONCEALMENT

on

off

Note: *If turned on the last available good field will be displayed upon encountering a concealment*

Analog Video Output Selections

ANALOG VIDEO OUTPUT

N/A

rgb

y r-y b-y

beta

Note: *(Available only if option is installed.)*

4.4.8   Setting Audio output selections

Refer to Figure 4.10

Audio Output Advance Setup: Audio output signals are advanced to compensate for delays that are introduced by external digital processing equipment. One clock cycle period, at 48 KHz, equals 20.8 μs.

Audio Output Timing Selections

AUDIO OUTPUT TIMING

Press **CHANGE** button and change with adjust knob

+3000 advance (Audio is ahead)

-255 advance (Audio is behind)

Audio Output

Selsync Advance Clocks Selections

SELSYNC ADVANCE CLOCKS

Press **CHANGE** button and change with adjust knob (+143 max. for AES), (+134 max. for embedded)(+82 max. for analog)

Audio Muting Selections

Refer to Figure 4.10

AUDIO MUTE

on   No audio at channel output, except in play mode.

auto   Audio only in –1 to +3 play speeds (audio is muted at other tape speeds.)

Monitor Cue In Shuttle Selections

MONITOR CUE IN SHUTTLE

on	If the audio mix to cue had been turned on during the record process, then during shuttle the audio will switch from the digital audio tracks to the cue audio track when the transport accelerates beyond 3 times play speed. This effects the monitor output only.
off	Audio monitor will not switch from digital to cue track during shuttle.

4.4.9   System setup selections
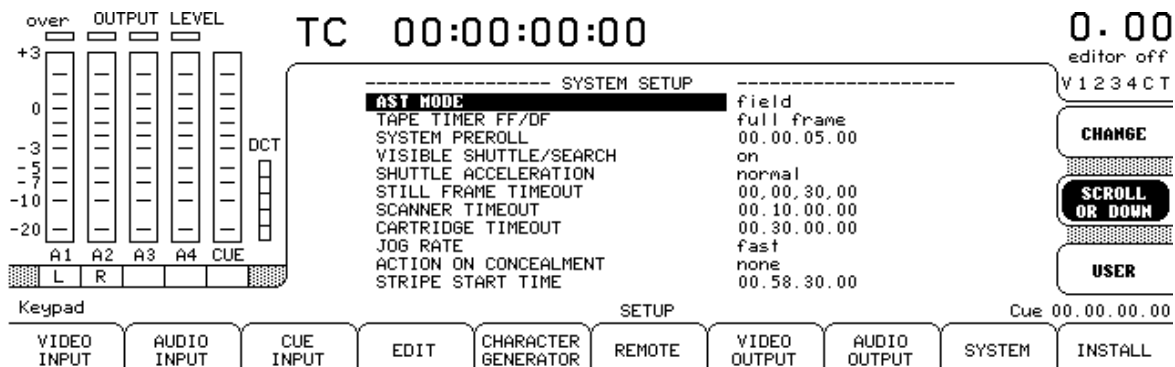
Figure 4.11 System Setup

SYSTEM SETUP accesses the system setup section of the menus.

AST (Automatic Scan Tracking) Mode Selections

AST
Setup

From the System Setup menu, scroll to AST MODE and press the **CHANGE** key repeatedly to select:

AST MODE

field	Plays back field only; used when playing back sequences with motion.
frame	Plays back true frame (field 1 and 2 or f2, f1 depending on remote edit field selection); often used when playing back graphics. (still frame only)
off	AST mode off.

Tape Timer Selections

TAPE TIMER FF/DF   (Available only when in 525 line standard)

full frame

drop frame

System Preroll Selections

System preroll is the duration of time that the drive will roll tape (at normal speed in order to synchronize) prior to reaching a selected cue point. Note that system preroll time is independent of edit, animate and preroll time set in the edit menus.

SYSTEM PREROLL

System Preroll

Enter still frame time-out duration into temporary keypad register using numeric keypad. Duration is entered as hours, minutes, seconds and frames.

Scroll to SYSTEM PREROLL and press **CHANGE** key to load time from temporary keypad register to the SYSTEM PREROLL register. Figure 4.11 shows still frame time-out duration of 5 seconds.

Note: *System preroll defaults to 05:00 if no other time is entered.*

Visible Search Selections

VISIBLE SHUTTLE/SEARCH

on

off

Note: *If on is selected, the scanner speed is increased during search. If on, shuttle defaults to tape ignoring ee/tape preference, and off tape pictures will be displayed during shuttle.*

Shuttle Acceleration Selections

Shuttle acceleration rates can be programmed with the SHUTTLE ACCELERATION selection in the SYSTEM section of the Setup menu, to one of four ranges:

SHUTTLE ACCELERATION

normal	12,700 mm/s^2 for small cartridge
	10,160 mm/s^2 for medium cartridge
	2,540 mm/s^2 for large cartridge
slow	2,540 mm/s^2 for all cartridges
slower	1,200 mm/s^2 for all cartridges
slowest	500 mm/s^2 for all cartridges

Shuttle Accel

Shuttle deceleration operates at the maximum rate, which produces an asymmetric shuttle profile. Selecting a shuttle acceleration other than NORMAL changes only the shuttle profile not *SRCH* or *CUE*.

Still Frame Time-out Selections

Still Frame Time Out

Still frame time-out is the time tape is wrapped around helical scanner with no tape motion. Tape damage could occur if heads are in contact with tape for too long in the still frame mode. Normally, still frame time-out is set for 30 seconds (system default time).

STILL FRAME TIMEOUT

Enter still frame time-out duration into temporary keypad register using numeric keypad. Duration is entered as hours, minutes, seconds and frames, with a maximum of 2 minutes.

Scroll to STILL FRAME TIMEOUT and press **CHANGE** key to load time from temporary keypad register to STILL FRAME TIMEOUT register. Figure 4.11 shows still frame time-out duration of 30 seconds.

Note: *System defaults to 30:00 if no other time is entered.*

Scanner time-out:

Scanner time-out is the time the scanner will remain on after the still frame time-out has occurred. Any transport request will turn the scanner back on.

SCANNER TIMEOUT

Enter scanner time-out duration into temporary keypad register using numeric keypad. Duration is entered as hours, minutes, seconds and frames, with a maximum of 1 Hour.

Scroll to SCANNER TIMEOUT and press **CHANGE** key to load time from temporary keypad register to SCANNER TIMEOUT register. Figure 4.11 shows SCANNER time-out duration of 10 minutes.

Time Out Selects

Note: *System defaults to 10:00:00 if no other time is entered.*

Cartridge time-out Selections

Cartridge time-out is the time the cartridge will remain in the transport with tape tensioned and wrapped around the longitudinal time code head after the scanner time-out has occurred. Any transport request will cause the cartridge to be inserted back into the transport and readied.

CARTRIDGE TIMEOUT

Enter cartridge time-out duration into temporary keypad register using numeric keypad. Duration is entered as hours, minutes, seconds and frames, with a maximum of 12 Hours.

Scroll to CARTRIDGE TIMEOUT and press **CHANGE** key to load time from temporary keypad register to CARTRIDGE TIMEOUT register. Figure 4.11 shows cartridge time-out duration of 30 minutes.

Note: *System defaults to 30:00:00 if no other time is entered.*

Setting Jog Rate Selections

The jog rate is the ratio of control knob turns to capstan rotation speed during jog mode.

JOG RATE

slow

normal

fast

turbo

To use audio from the digital tracks for cueing, the jog rate should be set to **turbo** or **fast**.

Full play speed is attainable when jogging forward, and slightly less than –1X play speed is attainable when jogging in reverse.

Action on concealment Selections

Should a concealment occur during a record or playback sequence, the drive can be programmed to take one of the following actions. If none is selected, there will be no action taken other then to log it in the concealment logging menu. If serial tally is selected, then the drive will send a synchronizing response to the edit controller via the RS-422 port causing an aborted edit. If stop is selected, the drive will stop after the occurrence of a concealment. This mode is useful if the drive is a source drive in the edit suite.

Note: *When serial tally is used the operator must determine whether the device which is to receive the tally is capable of acting on this tally information. Most edit controllers will only respond to this tally if it is coming from the record drive during an edit. Communications of this type are not received or acknowledged from a source drive or drives once the record drive has initiated the edit.*

ACTION ON CONCEALMENT choices are;

serial tally

stop

Tape striping selections

The tape striping mode of operation has four setup selections. These selections allow the user to use this simple method of pre-striping tape from the home menu. By making no selections (thereby using the default settings) pre-striping can be done without having to preset the timecode generator or the test generator and without having to perform multiple edits. The DCT 1700d will allow you to produce a tape with a "Black leader" at the front of the tape, followed by a duration of bars and tones, and finally striping the rest of the tape with "Black" and Timecode. The Timecode can be set to a predetermined time code address which will be the start of program point.

Stripe Start Time

Tape Stripe Selects

STRIPE START TIME

This is the starting number for the time code generator.

Note: System defaults to 00:58:30:00 if no number is entered.

Stripe Pre-Bar Duration

STRIPE PRE-BAR DURATION

This is the time from the start of the tape to where the recording of bars and tone will start.

Note: System defaults to 00:00:30:00 if no number is entered.

Stripe Bar Duration

STRIPE BAR DURATION

This is the length of time that the bars and tone will be recorded on the tape.

Note: System defaults to 00:00:30:00 if no number is entered.

Stripe Bar Source Selections

STRIPE BAR SOURCE

internal   Selects the internal test signal
                 generator as the source for the full
                 field colors bars.

external   Selects the signal at the video input to
                 the drive as the source for the bar
                 section of the striping operation.

Note 1:   System defaults to internal.

*Note 2:   The combination of the default settings will result in
            producing a stripe tape with time code starting at
            00:58:30:00 and colors bars and tones starting 30
            seconds later at 00:59:00:00 and ending at
            00:59:30:00. This tape can then be used in a edit
            session where the slate can be edited into the 30
            seconds from 00:59:30:00 and 01:00:00:00. In this
            case 01:00:00:00 would be the logical start of the
            program .*

*   If your standard operating procedure is to start the
            program at 00:00:00:00 then change the **stripe start
            time** to 23:58:30:00. The default value was chosen to
            possibly prevent problems with some edit systems which
            have less than desirable results in cueing to the start of
            the day or 00:00:00:00*

Stripe Timecode Selections

STRIPE FF/DF

drop frame

full frame

*Note: System default is drop frame, only present in 525
            operation.*

4.4.10 Install
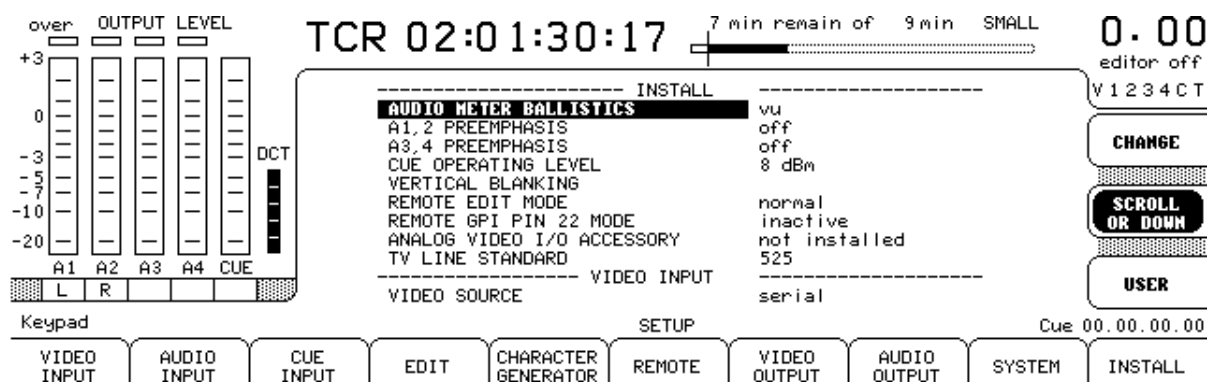
Figure 4.12 Install Menu

Install

The Install setup accesses the installation section parameters of the DCT 1700d and is entered from the SETUP menu.

Meter Ballistics Selections

AUDIO METER BALLISTICS

vu (volume units), ppm (peak program meter), ppm coarse ppm fine.

The selected audio metering ballistics are displayed on all operating menus. VU metering is shown in Fig 4.12, and standard PPM display, while covering a range from -28 to +20, has steps that only range from -12 to +12.

PPM Coarse   PPM Fine
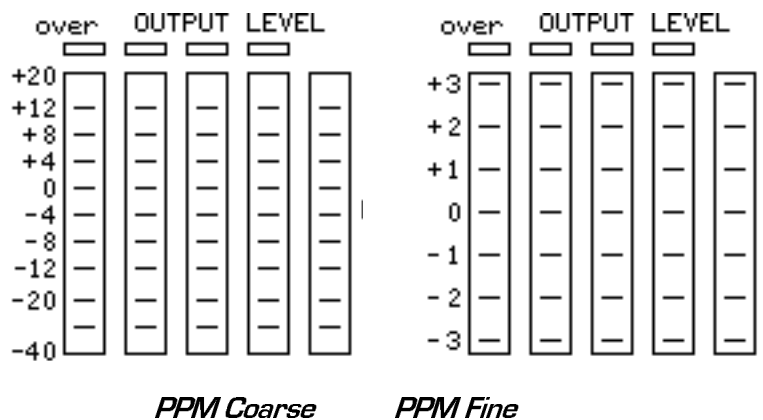
Figure 4.13 Two of the Audio Meter Ballistic options

Pre emphasis for Analog Input Signal·Selections

When pre emphasis function is activated, the level of the high frequency analog audio input signals are pre-emphasized during recording, while the level of any noise remains the same. When played back, the audio signal is automatically returned to its original level and, simultaneously, the noise is reduced to a negligible level.

This function is normally turned off. If the analog audio input level is abnormally high level at frequencies above 3 KHz, the pre emphasis function should stay turned off.

Note: *The pre emphasis function cannot be actuated for digital input signals. However, if digital input signal has been emphasized by external equipment using AES/EBU format CD type (15/50 ms) method, the analog converted signal is de-emphasized when played back.*

If digital input signal has been reemphasized using the CCITT type method, the analog output is not de-emphasized.

A1,2 PRE-EMPHASIS

    on

    off

A3,4 PRE-EMPHASIS

    on

    off

Cue Operating Level Selections

Set the cue operating level between –8 dBm and +8 dBm in 1 dBm increments. The value selected is indicated as 0 VU or 0 PPM on control panel meters.

CUE OPERATING LEVEL

Press **CHANGE** button and change with adjust knob.

Unblanking Vertical Interval Lines Selections
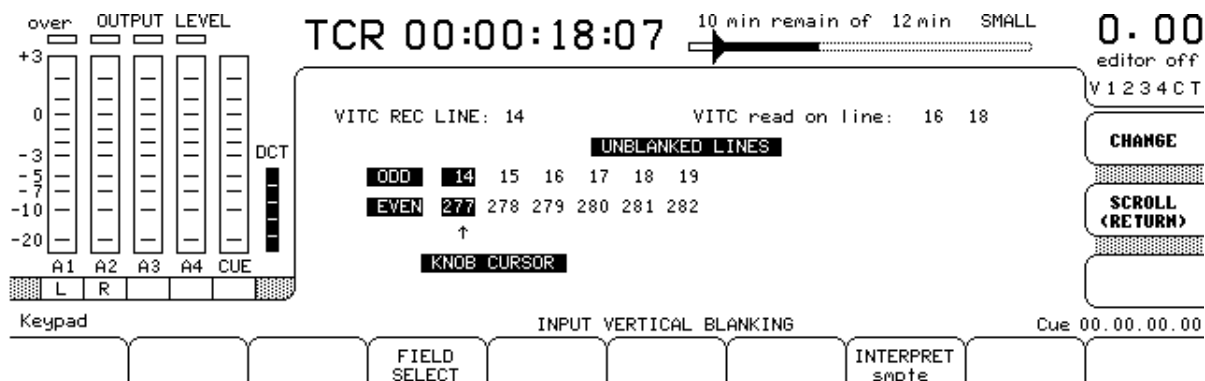
Figure 4.14 Blanking Setup

During playback, certain horizontal lines in the vertical interval of the input signal can be unblanked

VERTICAL BLANKING

From the Install Setup menu, scroll to VERTICAL BLANKING and press the **CHANGE** key . This will bring up a vertical blanking menu and displays vertical interval line numbers for the system in use as follows:

525: only horizontal lines 14 - 19 and 277 - 282 are displayed

625: only actual lines affected for two fields are displayed. For instance, odd field lines 11 - 22 represented actual line numbering scheme for fields 1 and 3.

Table 4.4 Unblanked Lines in Two Field Sequence-525

Field	Line Number					
Odd	14	15	16	17	18	19
Even	277	278	279	280	281	282

Note: *For drives configured in the 525/60 mode of operation, there are two differing ways blanking may be interpreted. Some pieces of equipment use the CCIR method of determining blanking rules (The DCT 700s switcher uses CCIR rules of operation) while others use the SMPTE method. Please check the source device specifications for the rule that applies and set the drive accordingly.*

Verify **INTERPRET** softkey for the appropriate mode of operation.

Press **FIELD SELECT** to chose ODD, EVEN, or both ODD and EVEN (both highlighted) fields.

Turn adjust knob to position arrow-cursor (♠) under selected lines.

Press **CHANGE** to select:

unblank - Highlighted line number will be unblanked

blank - Numbers with highlight removed are blanked

Example:

To unblank odd field lines 14 and 16 through 19 proceed as follows:

1   Press **FIELD SELECT** to highlight ODD only.

2   Turn adjust knob to place arrow below line 14.

3   Press **CHANGE**. Line 14 will highlight indicating unblanked condition.

4   Turn adjust knob to place arrow below line 16.

5   Press **CHANGE**. Line 16 will highlight indicating unblanked condition.

6   Repeat steps 2 through 5 for lines 17, 18, and 19.

To blank the lines unblanked above:

1   Turn adjust knob to place arrow below line 19

2   Press **CHANGE**. Highlight will remove from line 19 indicating blanked condition.

3   Turn adjust knob counter-clockwise to select each line then push **CHANGE** to remove highlighted line number.

4   Press **SCROLL** (RETURN) to return to main setup menu.

Remote Edit Mode Selections

The remote edit mode will determine how the audio edit will function. In normal mode the audio edits will be treated as a normal edit. In the assemble = selsync mode when ever the controlling device requests the assemble mode the audio edits will be treated as a selsync edit. In the insert = selsync mode when ever the controlling device requests the insert mode the audio edits will be treated as a selsync edit.

REMOTE EDIT MODE

normal

assemble = selsync

insert = selsync

GPI Pin 22 Function Selections

The **GPI PIN 22** selection sets the function assigned to pin 22 on the GPI interface

REMOTE GPI PIN 22 MODE

cue log	Loads tape position values into the Search-to-Cue registers and increments selected register (Cue 0 to Cue 99 registers). At Cue 99, further commands continuously load this register, without cycling to Cue 0 register.
inactive	Pin 22 contact closure or switch has no effect.
toggle rmt	Toggles port selection (Remote Port 1 or Remote Port 2) when the machine is in Remote mode and pin 22 contact is activated.

Analog Video I/O Accessory Selections

ANALOG VIDEO I/O ACCESSORY

not installed

installed

Note: *If the analog video accessory is installed in the drive, the accessory must be turned on from this menu. Activating this function will allow selection of the analog input from the video input setup menu.*

Screen saver Selections

SCREEN SAVER

on   The screen saver will turn off the back light for the screen after several idle minutes. Any control panel function will turn on the back light.

off

TV Line Standard Selections

TV Line Select

The TV line standard selection will change (toggle) the drive between the 525/60 television line standard and the 625/50 line standard. A warning message will appear on the LCD screen advising of a cartridge still in the transport and asking you to remove it first if one is present. If no cartridge is present then there will be a warning message asking if you are sure this is what you really want to do. It will take approximately 30 seconds to re-set and return the drive to an operational status.

TV LINE STANDARD

525

625
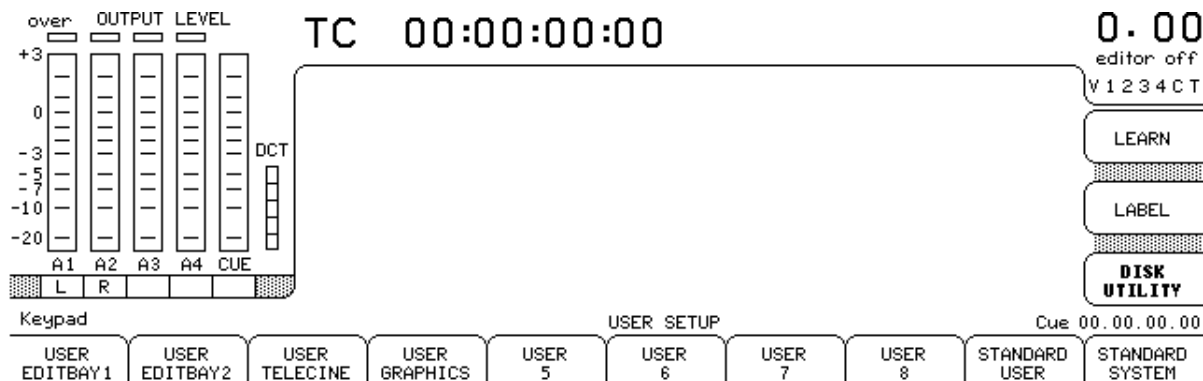
4.5   User Setup

Figure 4.15 User Setup

User Setup

Standard User

STANDARD USER will set the drive to factory default values for all items ordinarily stored in user setups.

Standard System

STANDARD SYSTEM will set the drive to factory default values for all system items not stored as a user setup.

The User Setup menu, which is reached from SETUP menu, provides the operator an easy, one-button selection to access user machine set-up modes—an operation that would otherwise require pressing dozens of soft keys and going through numerous menus.

USER 1 through **USER 8** and **STANDARD USER** soft keys are used for machine setups

Initially, the operator uses User Setup menu to store preset conditions established with procedures in this section. In addition, the operator can use the menu to make a eight-character label in the soft key windows that activates setup conditions.

Once conditions are set and stored, the operator uses User Setup menu to select:

- One of the eight pre-selected user soft keys (machine setup mode)

- Standard user (factory set) setup

- Standard system (factory set) setup

User Setup Parameters are as Follows:

Note: *The standard factory defaults are the selection highlighted in bold italics. These are also the default conditions when standard system is selected.*

VIDEO INPUT MENU

- VIDEO SOURCE - parallel, serial, n/a(rgb, y/b-y/r-y)

- VIDEO DATA WORD LENGTH - *ten bit*, eight bit

AUDIO INPUT MENU

- ALL AUDIO CHANNEL SOURCE - *analog*, aes, embedded

- A1 SOURCE - *analog*, aes, embedded

- A2 SOURCE - *analog*, aes, embedded

- A3 SOURCE- *analog*, aes, embedded

- A4 SOURCE- *analog*, aes, embedded

- AUDIO TEST GENERATOR - *off* on,

- AUDIO MUTE EDIT FLAGS - *record*, record disabled

CUE INPUT MENU

*   CUE SOURCE - *cue input*, digital mix

*   MIX A1 -> CUE - *off* ,on

*   MIX A2 -> CUE - *off* ,on

*   MIX A3 -> CUE - *off* ,on

*   MIX A4 -> CUE - *off* ,on

VIDEO OUTPUT SETUP MENU

*   VIDEO ABSENT MUTE - *last field*, black, last field/ee

*   HORIZONTAL PHASE - *0*, -858 to +858 steps

*   VIDEO DATA WORD LENGTH - *eight bit*, ten bit

*   FULL FIELD CONCEALMENT - *on*, off

*   ANALOG VIDEO OUTPUT - *n/a* (rgb, y/b-y/r-y)

AUDIO OUTPUT SETUP MENU

*   AUDIO OUTPUT TIMING - *0*, -244 to +3000 clks

*   SELSYNC ADVANCE CLOCK - *0* to 143 *aes*, 0 to 134 embd, 0 to 82 anlg

*   AUDIO MUTE - *auto*, on

*   MONITOR CUE IN SHUTTLE - *on*, off

EDIT SETUP MENU

*   ANIMATION PREROLL - (*00:00:01:00*)

*   EDIT PREROLL - (*00:00:05:00*)

*   EDIT POSTROLL - (*00:00:01:00*)

*   AUTO TAG - *on*, off

*   INS/ASM PREROLL AUTO OPTIMIZE - *off*, on

CHARACTER GENERATOR SETUP MENU

- CHAR DISPLAY MODE - *time*, user, tcr and user, tcg, and user off

- CHAR DISPLAY SELECT - *selected timer*, tcr, tcg, all, tcg, and user

- CHAR STATUS LINE - *on*, off

- CHAR BACKGROUND - *off*, on

- CHAR COLOR - *white*, black

- CHAR SIZE - *large*, small

- CHAR AUDIO BARGRAPHS - *off*, audio 1 & 2, audio 3 & 4, both

- CHAR POSITION SELECT - *characters*, audio 1 & 2, audio 3 & 4

- CHAR HORIZONTAL POSITION - Lower third center, variable with Adjust knob.

- CHAR VERTICAL POSITION - Lower third center, variable with Adjust knob.

REMOTE SETUP MENU

- REMOTE EDIT FIELD - *field 1*, field 2, rmt time

- REMOTE SLO-MO EDIT MODE - *vplay only*, tso/vplay

- LOCAL CONTROL ACTIVE IN REMOTE - *stop, eject (stopped),* all, & none

- REMOTE 1 PROTOCOL - *asmpte*, asmpte "vpr 300", sony, sony "2100", beta-chase.

- REMOTE 1 ADDRESS - *1*, 0 to 8176

- REMOTE 1 INTERFACE - *rs422*, rs232

- REMOTE 1 BAUD RATE - *38.4k*, 9600, 1200

- REMOTE 2 PROTOCOL - *asmpte*, asmpte "vpr 300", sony, sony "2100", beta chase

- REMOTE 2 ADDRESS - *1*, 0 to 8176

- REMOTE 2 INTERFACE - *rs422*, rs232

- REMOTE 2 BAUD RATE - *38.4k*, 9600, 1200

- SERIAL RECORD REAL TIME OFFSET - *0*, -4 to +4

- SERIAL PLAYBACK REAL TIME OFFSET - *0,* -4 to +4

- ACE SMPTE IMM ROLL RESPONSE - *sync*, play

- IMMEDIATE ROLL SYNC (PLAY) OFFSET - *0*, -4 to +4

- BETA CHASE SOURCE ADVANCE - *0,* -4 to +4

SYSTEM SETUP MENU

- AST MODE - *field*, frame, off

- TAPE TIMER ff/df - *full frame***,** drop frame

- SYSTEM PREROLL - (*00:00:05:00*)

- VISIBLE SHUTTLE/SEARCH - *on*, off

- SHUTTLE ACCELERATION - *normal*, slow

- STILL FRAME TIME OUT - (*00:00:30:00*)

- SCANNER TIME-OUT - (*00:10:00:00*)

- CARTRIDGE TIME-OUT - (*00:30:00:00*)

- JOG RATE - *fast*, turbo ,slow, normal

- ACTION ON CONCEALMENT - *none*, serial tally, stop

- STRIPE START TIME *(00:58:30:00)*

- STRIPE PRE-BAR DURATION *(00:00:30:00)*

- STRIPE BAR DURATION *(00:00:30:00)*

- STRIPE BAR SOURCE *internal,* external

- STRIPE ff/df *full frame,* drop frame

INSTALL MENU

- Meter ballistics - *vu*, ppm, ppm coarse, ppm fine

- A1, 2 PRE EMPHASIS - *off*, on

- A3, 4 PRE-EMPHASIS - *off*, on

- VERTICAL BLANKING - *odd*, even lines, (all lines unblanked)

- FIELD SELECT - *both*, odd, even

- INTERPRET - *SMPTE*, CCIR (525 only)

- REMOTE EDIT MODE - *normal*, insert = selsync, assemble = selsync

- REMOTE GPI PIN 22 MODE - *inactive*, toggle remote, cue-log

- ANALOG VIDEO I/O ACCESSORY - *not installed*, installed

- SCREEN SAVER - *on*, off

- TV LINE STANDARD - *525*, 625

Note: *The following are also stored in the user setups but are not part of the setup menu structure.*

- REMOTE SELECTIONS - 1, 2 and 3, (Default state is none selected).

- EDITOR MODE - *off*, insert, assemble

HOME MENU

- TAPE TIMER SELECT - *tcr*, ubr, tt1, tt2

- FREEZE MODE - *off*, on

- FRZ FIELD SELECT - *field*, odd, even, frame

INPUT MENU

- ANALOG AUDIO INPUT GAINS - **0 dB**, variable with Adjust knob.

- CUE CHANNEL INPUT GAIN

OUTPUT MENU

- ANALOG OUTPUT GAINS - **0 dB**, variable with Adjust knob.

- CUE CHANNEL OUTPUT GAIN

MONITOR MENU

- WAVEFORM MONITOR SELECT - *video*-rf-tc/ct-aux

- LEFT AUDIO MONITOR - *a1*-a2-a3-a4-cue

- RIGHT AUDIO MONITOR - *a2*-a1-a3-a4-cue

TC MENU

    GENERATOR

        TCG SOURCE - *internal*-external

        RECORD LINE - *14*-19 (525), *11*-22 (625)

        VITC RECORD - *on*-off

        ASSEMBLE AUTO JAM - *on*-off

        TCG FF-DF (525) - *full frame*- drop frame

        TCG MODE - *run*-sequence-jam-slave

    READER

        TC READER - *auto*-ltc-VITC

        VITC READ LINE - *any*-record

- **USERBITS**

  RDR. USER MODE - *ASCII*-binary-time

  GEN. USER MODE - *ASCII*-binary

  GEN. USER TIME MODE - *run*-sequence-jam-slave

User Setup Parameters Not Stored as User Setups but as System Setup are as Follows:

- TV LINE STANDARD - *525*, 625

- CUE OPERATING LEVEL - *+8,* +8 to -8 dbm

- VERTICAL PICTURE POSITION - *0*, -30 to +30 steps

- HORIZONTAL PICTURE POSITION - *0*, -40 to +40 lines

4.5.1 Labeling Soft Key Functions

Label Keys
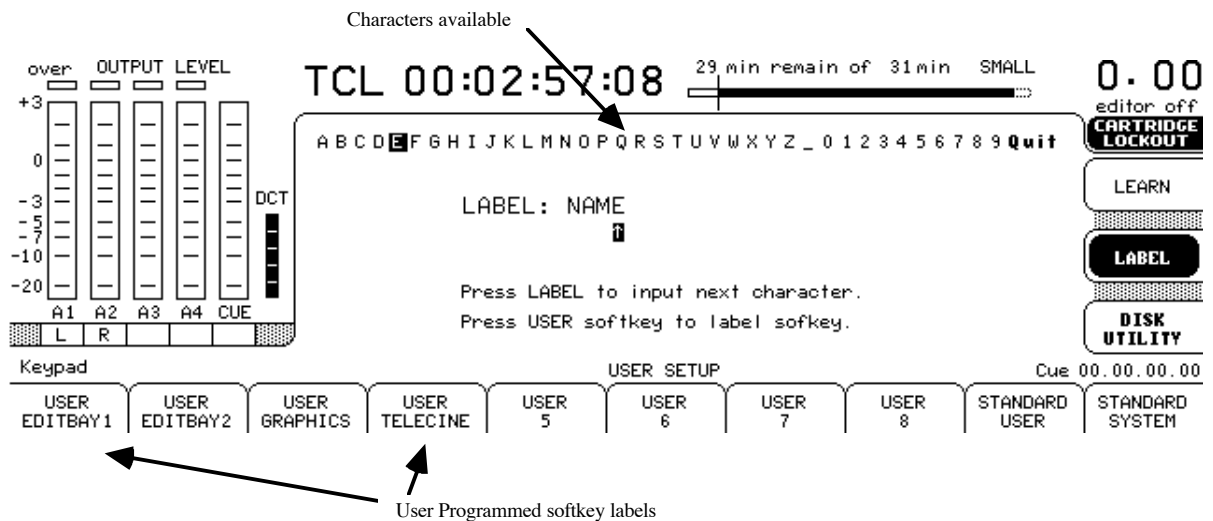
Figure 4.16 User Labeling

An eight-character label identifying the eight user pre-selected machine setup modes is placed in the preset soft key.

To label a soft key:

1. Press **USER** soft key from Setup menu to bring up User Setup menu.

2. Press **LABEL** soft key to highlight function. The following message is displayed:

   LABEL:

3. Turn adjust knob to select first character (number, symbol, or letter).

4. Press **LABEL** soft key again to move arrow to next character position.

5. Turn adjust knob to select next character.

6. Repeat steps 4 and 5 for desired characters. A maximum of eight characters can be used.

7. Press selected setup soft key to label the soft key.

Note: *The label key can also be used to step through the label that is being created. It will step to the next character with the last position being one greater than the number of characters that have been entered. This allows the user to continue to press label and the cursor will wrap back to the first character to allow corrections or changes to be made anywhere in the label. The quit command is also in the character selection group to allow the user to exit this mode with out storing a label. The underscore is used where a space is desired since file storage formats typically do not allow storage of blank characters or spaces.*

4.5.2   Learning the Setups

The drive can be set up automatically from stored setup data that has previously been "learned." The drive is first setup using procedures presented earlier in this section, then the setup is learned by the drive.

To learn setup:

1   Press **LEARN** soft key from the Setup menu to highlight function.

The following message will appear

ENTER PASSWORD - PRESS LEARN AGAIN

Learn Setup

Note: Please refer to the service manual for the password information.

2   Enter your password then press LEARN again. The following message will appear

PRESS USER SOFTKEY TO BE LEARNED

3   Press one of the following setup soft keys:

•   **USER** (**1**–**8**): Soft key functions may be labeled.

The following message will appear

TO LEARN USER - PRESS SELECTED USER AGAIN

4.   Press the selected user soft key again to learn new setup.

Note: Press selected soft key twice within about 1.5 seconds, otherwise, message goes away and setup is not learned.

Setup is learned when highlight is automatically removed from **LEARN** soft key function and the selected user soft key function is highlighted.

4.5.3   Selecting a Setup

Refer to Figure 4.15 User Setup

To select a setup that has been stored earlier:

1. Press one of the following setup soft keys:

    USER (**1**–**8**): Soft key functions may be labeled.

    Select
    Setup

    STANDARD USER

    STANDARD SYSTEM

    The following message appears:

    TO ACTIVATE USER - PRESS SELECTED USER AGAIN

2. Press the selected setup soft key again to select new setup.

Note: 1   *Press selected user soft key twice within about 1.5 seconds, otherwise, message goes away and setup is not selected.*

Note: 2   *Setup is selected when highlight is transferred from previous setup soft key function to the new soft key function.*

4.5.4   Storing User Files to Disk

The user files which have been learned and labeled may also be stored to a 3.5" floppy disk for archival storage or for easy setup of additional drives. This facility is accessed as a sub - menu of the USER SETUP menu. See fig 4.15 for User Setup menu.

The Soft Key on the right side of the menu labeled DISK UTILITY is used to access the USER DISK UTILITY menu where the storage and recalling of user setups is accomplished.
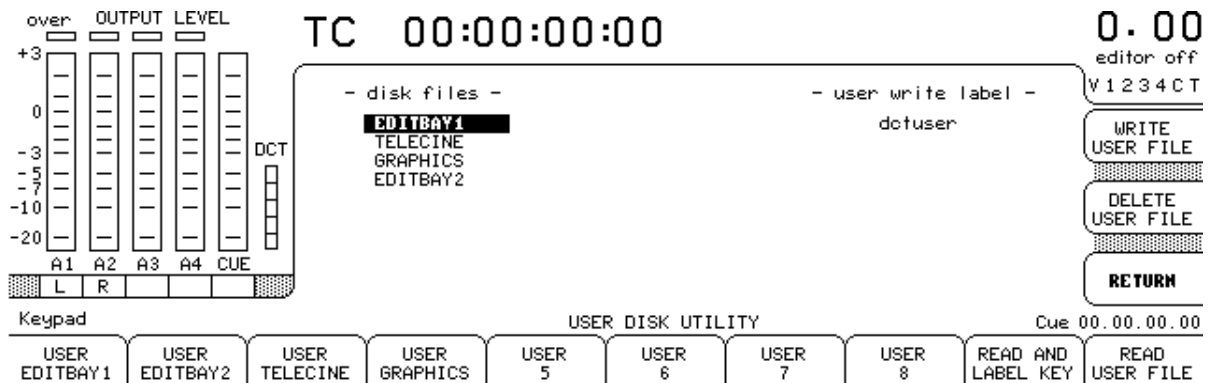
Fig 4.17 USER DISK UTILITY

To store a setup

Storing User Files

1. Press the softkey labeled Disk Utility

   A message "**looking for disk**" should appear on the menu

   Under the disk files header it will read "**no user files**"

   Under the user write label it should read "dctuser" which is the default user file name

2. Insert a DOS formatted 3.5" floppy disk in the disk drive slot on the front of the drive.

   The menu should show the message "**reading file system**"

   If the disk is not formatted or is the wrong type of disk the message will read "**disk timeout**"

The left side of the menu screen under the "disk files" header will either show the names of the setup files stored on the disk, or the statement " no user files"

3. Select the user setup to be written to the floppy disk

The area below the "**user write label**" should indicate the name of the selected user setup

Note: *This area will always indicate the selected user setup, or the default "dctuser" which will be written to the disk if a current user file is not selected prior to initiating the "write user file" sequence. In addition if the user setups have not been labeled the default number as shown on the eight soft keys will be used to identify the file when it is written to floppy disk.*

                Another way to use this "user write label ", is to use the label user setup area on the previous menu to create a label. Then, without labeling a setup, enter the disk utility, the label which was created in the labeling area will now be in the " write user label" area of the display. This will be the label which will be stored with the existing user setup if you use the "write user file" without selecting a user setup. This will allow you to easily change the label on a user setup file without ever saving it to a user setup on the DCT 1700d drive.

4. Press the WRITE USER FILE softkey

The menu should show "**checking for existing file**"

If it finds a file with the same name the message "**file exists, delete before writing**"

If there is no file of the same name it will indicate "**writing file to disk**"

When the writing is complete, which takes about 10 seconds, the display will indicate "reading filesystem" and the disk files area of the menu will be updated with the previous file information and the additional file which was just written to disk.

4.5.5   Deleting User Files from Disk

To delete a user setup file from a disk

1. Press the softkey labeled " DELETE USER FILE"

The menu will prompt you to:

HIGHLIGHT FILENAME - PRESS DELETE AGAIN

2. Use the adjustment knob to move the highlight to the filename which is be deleted.

3. Press the softkey DELETE USER FILE, again,

**Delete
User
Files**

The menu will indicate: **deleting file.**

When the deletion is complete the menu will indicate: **reading filesystem.**

When this is complete, the disk files area of the menu will be updated to indicate the files remaining on the disk, which will be the same as the previous display, without the file which was highlighted in step #2 in this procedure.

4.5.6   Reading User Files from Disk

When a user file is read from a floppy disk it changes all of the user setups from their previous presets to those described by the file coming from the disk. This facility allows the user to review a file and decide by reviewing the setup menus on a page by page basis whether it is the desired setup to be stored in a user storage location on the drive. If changes are required to meet the current operational requirements they can then be accomplished very easily by changing the various setups and then either storing the file in a storage location on the machine or writing it to a floppy disk for archival storage or transfer to another drive.

To read a user file:

**Read
User
Files**

1. Press the softkey labeled " READ USER FILE"

    The menu will prompt you to:

    HIGHLIGHT FILENAME -PRESS READ AGAIN

2. Use the adjustment knob to move the highlight to the filename which is be read.

3. Press the softkey " READ USER FILE", again,

4.5.7   Reading User Files and Labeling a User Softkey

When a userfile is read from disk and is to be stored as a user setup on the DCT 1700d tape drive, a procedure which is labeled " READ AND LABEL KEY" is used. This is a single function that combines the reading, storing and labeling all in one simple step.

To read a user file and label a softkey you must enter a password in the keypad register in the same manner required by the " learn setup" which was described in Section 4.5.2 It is easier to enter this password before the procedure is started since all of these procedures have a time-out requirement which may be exceeded by the entering of the password as a step in the procedure.

ENTER PASSWORD

Note: Please refer to the service manual for the password information.

1. Press the softkey labeled " READ AND LABEL KEY"

     The menu will prompt you to:

     HIGHLIGHT FILENAME - PRESS USER KEY TO LEARN

2. Use the adjustment knob to move the highlight to the filename which is be read.

3. Press the desired user key (1 - 8).

4. The selected USER key display will change to indicate the name from the user file previously highlighted.

Note: *The "enter the password " prompt may appear in step #1 if it has not been previously entered into the keypad register.*

4.6 Timecode

The tape timers of the DCT 1700d can be used to address particular points on the tape for editing the video or audio on the tape. This use of the tape timers has two major drawbacks that render it unsatisfactory for accurate editing. The first reason is that the tape timer is not guaranteed to be frame accurate at all points on the tape. Other reasons for this include; the timer is run from capstan and control track signals, and the control track may or may not be present at all times. This can cause slight inaccuracies in the tape timer. Also, when the tape cartridge is removed from the drive, all relationship of the tape timer to the tape is lost. This represents a severe disadvantage to editors who rely on the tape time for edit decisions and have to change tapes in an edit session.

The solution to this problem is to record data on the tape that contains information allowing each separate field of video to be uniquely identified. This data is referred to as 'timecode'. Historically, timecode was an audio rate signal that was recorded on a linear track at the edge of the tape and contained time information in the form: "hh:mm:ss:ff" with the fields being indicated by a ":" or ";" for an even field and "." or "," for an odd field, plus eight four bit nibbles of user data or user bits.

The full frame mode is available in both 525 and 625 line modes. In the 525 line operations the additional time code mode, namely drop frame is added This mode allows the time code to be true with respect to tape time but adds additional complexity to any time code related math functions. The timecode separation elements are changed from periods . and colons (:) to commas (,) and semi- colons (;) to allow the time code display to indicate the reading or generation of drop frame code.

Other control information is also embedded in the code. As this was recorded on a linear track it is commonly referred to as "longitudinal timecode".

As tape drives evolved and slow-motion replay became common, the difficulty of reading longitudinal timecode at very low tape speeds became a serious problem. To rectify this, a second timecode was developed and inserted in the video vertical interval, that could be read even with no tape motion. This code is known as "vertical interval timecode" or "VITC".

The DCT 1700d tape drive offers generation and reading of both longitudinal and vertical interval timecode. Further information on these two timecode specifications can be obtained from the documents ANSI/SMPTE 12M-1986 and EBU Tech. 3097-E.

To select tape timing by timecode, in the *home* menu press **TIMER SELECT** until the first two characters of the main timer indicator in the upper center of the display read "TC_". In this mode, the drive will indicate the status of the different timecode information and which mode is being used, designated by the third character of the indicator. The characters that can be displayed in this third space are: R, L, V, X, or _ .

If the system is setup to use timecode in the user bits, this display could be "UB_". The details of this mode will be in the User bit section which follows in the last part of this manual.

4.6.1 Timecode Menus

Control of most timecode functions on the drive is via a top-level menu selected by the *tc* key in the menu selection keys. Pressing this key will give the following display on the screen.

Figure 4.18 Timecode Reader

TC Menus

This is the timecode mode menu and controls timecode generator, time code reader and user bit modes. Pressing the soft-keys READER (fig 4.16), GENERATOR (fig 4.17), or USERBITS (fig 4.18) will select the timecode generator, timecode reader, or user bit menu soft keys below the common display as follows:
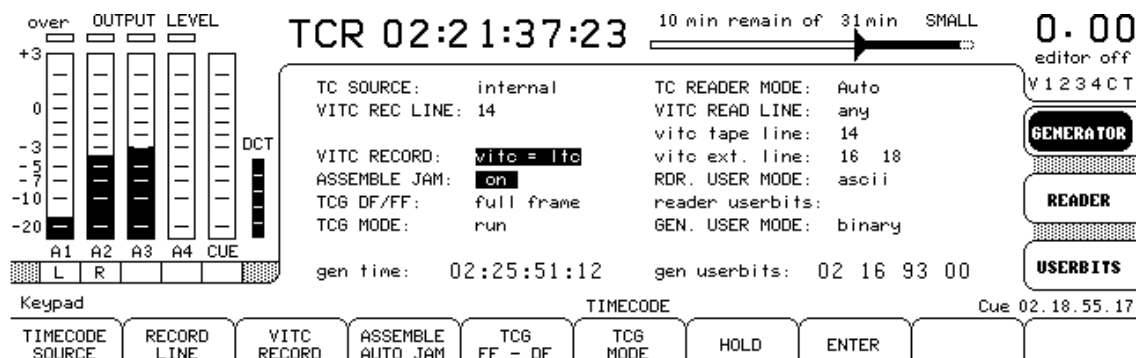
Figure 4.19 Timecode Generator

Note: *The first area to be explained will be the timecode reader which is the second entry on the menu. This will help the user to better understand the generator functions by reviewing the reader section first.*

4.6.2 Timecode Reading

The DCT 1700d has two Longitudinal and two Vertical interval timecode readers. One of the longitudinal readers is dedicated to the external timecode input for slaving to external timecode and has no user controls. One of the vertical interval readers is dedicated to input video for slaving to input video VITC and has the vertical interval line number from which it is reading timecode, indicated by the label **vitc ext. line**: The input video VITC reader has no further user controls.

The remaining longitudinal timecode reader is dedicated to reading timecode from the tape playback system and the remaining VITC reader is dedicated to reading timecode from the playback video signal.

4.6.3   Reader Selections

The following menu items and selections are accessible after the **READER** soft key is depressed and the **READER** indicator is highlighted.

TC READER MODE : selections **LTC, VITC,** or **Auto**

LTC :   Reads longitudinal timecode only.

VITC :   Reads vertical interval timecode only.

Auto: Reads both LTC and VITC.

The   Timecode Reader Label table 4.5 overview allows the user to easily read the conditions related to the time code being handled by the reader.

Table 4.5 Time Code Reader Labels

Label	LTC	VITC
TCR	present	present and same as LTC
TCL	present	absent or TCR mode indicates LTC
TCV	absent or TCR mode indicates VITC	present
TCX	present	present, but different than LTC
TC	absent	absent or TCR mode indicates LTC
TC	absent or	absent TCR mode indicates VITC

Reader Labels

VITC READ LINE: Selections are **record** or **any**.

record   reads and indicates the VITC line if it is the same line which is selected for VITC record.

Note: *This mode allows the reader to be forced to read only the same line as which new VITC is to be written. This is a good way to accommodate signals with multiple lines of VITC code.*

any   reads and indicates the first or second (if present) detected lines with VITC.

vitc tape line   indicates line selected by the VITC READ LINE selection.

vitc ext. line   indicates first two lines where VITC is detected on the video input signal.

4.6.4   Timecode Generator

The following menu items and selections are accessible after the *tc* menu is selected and menu selection appears for **GENERATOR,** soft button is depressed and the **Generator** softkey is highlighted..

TIMECODE SOURCE (TC SOURCE) Selections; internal or external

external	External timecode supplied to the tape drive both LTC and VITC are routed directly to Tape. The internal reader is used to display this number in E/E or Record.

Time Code Gen

Note: If there is no external LTC or VITC is present, no time code is recorded. In this mode the external code is used directly to record on tape, without any reshaping or reclocking. This mode should be used if external code contains userbit information which must be recorded on the tape.

internal	Internal allows five additional timecode generation decisions which are selected by the next five soft keys described below.
RECORD LINE	Activates an arrow (♠) which points at the location on the display where line 14-19 (525) or 11-22 (625) can be selected with the control Knob. This selects the line in the vertical interval on which the VITC signal will be recorded. A second control selection cancels the selection process retaining the selected line. The default lines are line 14 in 525 line operation and line 11 in 625 line operation.

VITC RECORD Selections are, VITC **=** LTC or OFF

vitc = ltc:	This is the selection to allow the Vertical Interval Time Code which is recorded to be the same as the Longitudinal Time Code.
off:	This turns off the VITC record function.

ASSEMBLE JAM: Selections are OFF or ON

The Assemble Auto Jam mode when ON forces the Timecode Source to Internal and TCG Mode to JAM (if Gen. User Time Mode is selected it forces the user bit mode to Jam) whenever the editor is in the Assemble Mode. It returns all of these to previous setting when editor is changed to any other mode. This purpose of this mode is to record continuous code across assemble edits on tape.

OFF: Turns this editor mode driven automatic selection function off.

TCG FF - DF (TCG DF/FF):   Selections are drop frame or full frame (525 line operation only)

drop frame: Selects the drop frame mode of operation of the timecode generator. This is indicated in the timecode display by replacement of the periods (.) and colons (:) with commas (,) and semi colons (;).

full frame: Selects the full frame mode of operation of the timecode generator. The timecode display uses periods (.) and colons (:).

TCG MODE: Selections are **jam, slave, run and sequence.**

jam: The Timecode Reader is reading the off tape timecode and loads the Internal Time Code Generator in preparation for an edit with the timecode channel enabled.

slave: The Time Code Generator is synchronized to the incoming LTC or VITC according to the READER, TC READER selection.

Note: *In this mode an additional display line directly below the TCG MODE selection display indicates* input read: XT_ *with this third character indicating the type of time code which the generator is slaved to.*

The following are the variations possible in this third character area: XT_ is indicated if external timecode is absent.

R:	Indicates that the reader is in the Auto mode and that the longitudinal time code (LTC) from the XLR input connector and the vertical interval time code (VITC) from the video input are the <u>same.</u>
L:	Indicates that the reader is in the LTC mode and that an LTC signal is connected to the XLR connector on the drive or that the TCR is in auto and <u>only</u> LTC is present.
V:	Indicates that the reader is in the VITC mode and that VITC signal is present in the incoming digital video signal or that the TCR is in auto and <u>only</u> VITC is present.
X:	Indicates that the reader is in the Auto mode and that the longitudinal time code (LTC) from the XLR input connector and the vertical interval time code (VITC) from the digital video input are <u>different.</u>
run:	The internal generator is presetable and runs continuously.
HOLD:	The internal generator is held (stopped) until the timecode channel is put into record, then it reverts to run. This is only available in the RUN mode.
ENTER:	The internal generator is loaded with the number in the Keypad. This is available in the RUN and SEQUENCE modes.
sequence:	The internal generator runs when the timecode channel is in record and holds when not in record.
gen time:	Indicates the current timecode generator value.

Note: *When TIMECODE SOURCE is set to external or the
             internal generator is set to slave*, gen time *is replaced
             with*

                        input reader:
                        ext time:

        ext time: indicates the external time code value.

4.6.5   User Bits

The following menu items and selections are accessible after the **USERBITS,** soft key is
depressed and the **USERBITS** indicator is highlighted.
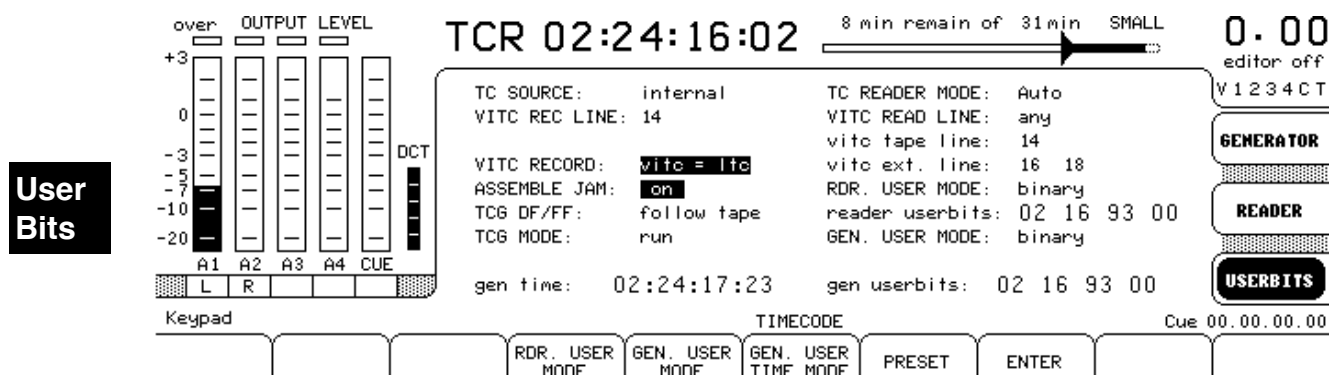
        RDR. USER MODE   Selections **ascii, binary** or **time,**

            ascii: Displays the user bit portion of the timecode
                                   signal as four ASCII characters.

            binary: Displays the user bit portion of the timecode
                                   signal as eight binary numbers.

            time: Displays the user bit portion of the timecode
                                   signal as time.

            reader userbits :   Displays userbits in selected format.

GEN. USER MODE Selections **are ascii, binary** or **external**

    ascii: Selects the ASCII coded generator mode for the user bit portion of the timecode signal.

    binary: Selects the binary coded generator mode for the user bit portion of the timecode signal.

    external: External user bits, LTC or VITC as selected by READER, TC READER MODE.

Note: *The selection of ASCII or binary modes changes the* **HOLD** *function of the user bit generator menu soft keys to* **PRESET** *.*

Time mode has an additional direct menu selection key

GEN. USER MODE: Selects the timecode generator mode of the user bit portion of the timecode signal.

    GEN. USER MODE Selections are JAM, SLAVE, RUN and SEQUENCE

    jam: The Userbit Reader is reading the off tape userbits and loads the Internal Userbit Generator with the off tape user bit code number just prior to the user bit generator starting the record process.

    slave: The Userbit Generator is running and is synchronized to the external LTC or VITC time code userbits fed to the tape drive and selected by the READER, TC READER MODE.

    run: The internal user bit generator is presetable and runs continuously.

    HOLD: The internal user bit generator is held (stopped) until the timecode channel is put into record, then it reverts to run. This is only available in the RUN mode.

    ENTER: The internal user bit generator is loaded with the number in the Keypad. This is available in the RUN and SEQUENCE modes.

sequence: The internal user bit generator runs when the timecode channel is in record and holds when not in record.

PRESET: Replaces Hold in the binary or ASCII modes of the user bit generator. Preset allows a value to be entered in either of these modes into the four available code locations. When this is Entered into the user bit generator, a new set of four values may be entered and "preset". This allows an instantaneous change between two different binary or ASCII values. The Enter key function is modified with the preset mode by now entering the PRESET value instead of the keypad register.

PRESET is also used to enter the values into the user bit gen. When the **PRESET** soft key is depressed, it activates an arrow (♠) below the first of four user bit cells, which allow a single character in ASCII or two characters in binary. This allows the desired character or characters be selected with the control Knob. The selected value is entered by the next push of the **PRESET** key. After all four cells are entered the last push removes the arrow (♠). Now the value that is displayed is the current user bit value. The depression of the **ENTER** softkey will load the preset register into the generator as described in previous paragraph.

gen userbits: Displays the current userbit values.

Table 4.6 Userbit Labels (userbits as Time)

Label	LTC	VITC
UBR	present	present and same as LTC
UBL	present	absent or TCR mode indicates LTC
UBV	absent or	present TCR mode indicates VITC
UBX	present	present, but different than LTC
UB	absent	absent or TCR mode indicates LTC
UB	absent or	absent TCR mode indicates VITC

AMPEX
DCT 1700d

Digital Component Tape Drive

Operation

BASIC OPERATIONS 5

Section 5
Basic Operation

Section 5 contains detailed information to allow operators to familiarize themselves with the Power-up procedure, and various transport modes of operation, of the DCT 1700d. Digital Component Tape Drive including Audio adjustment and monitoring.

Section 5 Contents

5.1   Power-up

Before applying power to the DCT 1700d, install and connect the drive into its operational facility. As this drive is line standard switchable, care must be taken to ensure that all input signals, reference signals and tape cartridge material* are provided in the same standard. After the hardware installation is complete, power can be applied and initial setup begun.

*Note: *The DCT 1700d will, if presented with a tape of the wrong standard, notify the operator by flashing the screen with the message "WRONG LINE STANDARD TAPE", and notify in which standard it is operating,. It will notify if it is presented with the wrong reference signal in a similar manner by displaying a "reference invalid" indication.*

To turn on the DCT 1700d:

Eject Button
Cartridge Load Slot
Menu Display and Softkeys
Numerical Keypad
Power Switch
Adjust Knob
Menu and Function Buttons
Transport Controls
Headphone Jack
Disk Drive
Headphone Level Control
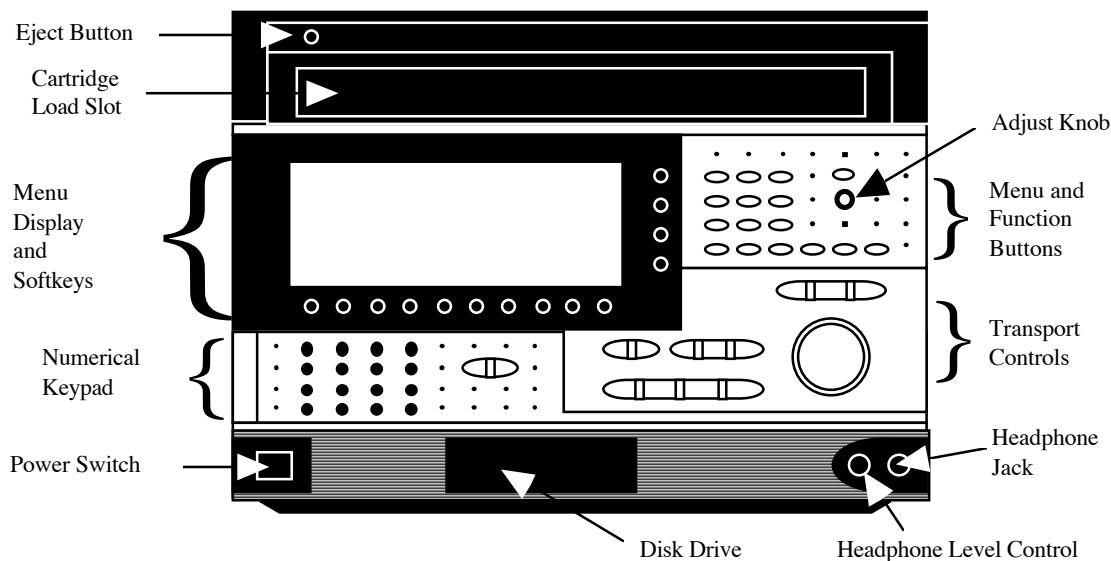
Figure 5.01 DCT 1700d Front View

1. Press the upper half of the power switch, which is located on the face of the drive in the lower left corner. The switch will illuminate and the DCT 1700d begins initialization, which is indicated by a startup message in the display. After approximately 20 seconds, initialization is complete, and the Home menu appears. This first Home menu after power-up displays machine copyright information and software version numbers that subsequent Home menu selections do not. This information is always displayed in the *home*, DIAG menu if required.

2. The initial *home* menu will display the selected line standard in small characters towards the top of the screen. A subsequent Home menu will display the line standard in large characters in the middle of the screen. If different from the intended operational standard, the line standard must be changed to match the desired standard. To do this, first press the <setup> menu select button, and then press the **INSTALL** soft-button to select the installation part of the Setup menu. Then use the adjust knob to move the highlight down to the line that reads "**TV LINE STANDARD**" and press the **CHANGE** soft-button to initiate the standard change. A warning that a system reset will occur and request a further press of the **CHANGE** soft-button. On pressing the **CHANGE** soft-button a second time, the drive will go through a system reset and revert to the Home menu displaying the new line standard value.
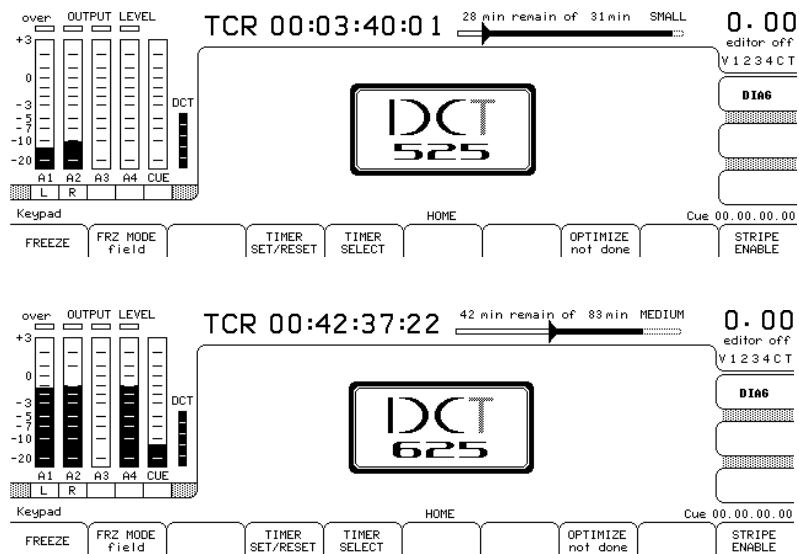
Figure 5.02 Illustrates the two Line standard Home screens.

3. If required, at this time protect the individual tape cartridge against accidental recording with the cartridge record lockout, located on the cartridge as described in Chapter 1, "DCT Cartridge", or, protect all cartridges using the master record lockout switch on the drive.

4. The system is now able to play a tape if required. Insert the tape cartridge into the load port at the front of the drive with the label side facing upwards, approximately centered on the port and push lightly. As the sensors detect the presence of a cartridge and it's size, the drive will automatically complete the cartridge insertion, and load the tape with the **STOP** button illuminating amber to tally this status. At this time, the scanner will also rotate to play speed to allow minimum delay from cartridge insert to play mode. Complete the play request by pushing the **PLAY** button and the drive will complete the threading of the tape and enter the play mode with the **PLAY** button illuminating green and the **READY** button illuminating amber as confirmation.

5. To remove the cartridge, press the **EJECT** button in the top left corner of the drive. This will automatically unthread the tape and eject the cartridge out of the load port.

If a tape is inserted into the drive which is not of the current operating line standard, the following full screen message will flash indicating a change of tape or standard is required.

WRONG LINE STANDARD TAPE

5.2 Transport modes

In order to optimally manage the handling of the tape in the cartridge, the DCT 1700d features two modes of threading the tape. The first and simplest is co-planar thread, where the tape is threaded onto both tension arms, the capstan is engaged but the path around the scanner or "helix" threading is not completed. The tape is presented to the longitudinal (stationary) head assembly for reading timecode, cue and control tracks. This mode of threading is used for high-speed shuttling of the tape without any rotary head wear, and as a standby thread mode when the helical thread is not required. In general, the scanner will be rotating at all times a cartridge is in the drive and is in use. The second threading mode is "helical" thread, where the tape is completely loaded around the scanner, with both longitudinal and rotary head assemblies in contact with the tape.

Modes

WARNING: Extended still picture playback may cause unnecessary wear to the tape and heads. To avoid prolonged head-to-tape contact, if possible use the last field video mute instead of still-frame playback.

To protect both the tape and drive when in intermittent operational use, three time-outs of differing lengths are applied to the drive. The first and shortest, the "still frame time-out", is when the tape is helically threaded as it would be in a still frame play configuration. Continued operation would result in unnecessary wear of the rotary heads and as the tape is stationary, increase the risk of tape wear and eventual cutting along the helix. This "still frame time-out" is programmable by the user, with a recommended time of 30 seconds, and a maximum of two minutes. When the drive is in any still frame configuration, with the rotary heads continuously reading the same tracks on the tape, the "still frame time-out" will be decremented. When zero is reached, the drive will unthread the helix and revert to a co-planar thread mode and a freeze frame will remain at the output. Any tape motion command during the countdown period will reset the time-out to it's preset value, thus extending the time-out period.

Note: *It is possible to defeat this time-out for certain operations. The user should understand the potential head and tape damage this could result in and be extremely cautious when choosing this option.*

The next time-out is the "scanner time-out", where, after the "still frame time-out" has expired the "scanner time-out" begins counting, and when this expires, the scanner drive is turned off. This is also programmable by the user and is recommended to be around 10 minutes, with a maximum of one hour. See section 4 Setup menu. The last time-out is the "cartridge time-out", where, after the "still frame time-out" and "scanner time-out" have expired, the "cartridge time-out" begins counting,, when it expires, the cartridge is partially ejected from the drive. This eject is only partial to allow the drive to re-inject the cartridge if requested by a remote controller. This is can be set by the user and recommended to be around 1 hour and has a maximum of twelve hours. See section 4 Setup menu.

Caution: All Time-outs may be defeated

Transport modes include ready, stop, play, record, edit record, cue, search, preview, edit, review, shuttle, jog, variable play, rewind and rewind/eject. These modes are all selectable from either a single press of a primary function button or a simultaneous press of two primary function buttons as described below:

5.2.1   Stop Mode *STOP*

The *Stop* mode has two conditions: **standby** and **ready**.

In the standby condition, the *STOP* button is lighted. In this condition, all reel motors are stationary and tape is unthreaded (coplanar threaded). The system is automatically placed in standby condition when:

- When a Cartridge tape is first loaded.

- When a still frame time-out occurs.

- At the end of a tape.

- When a malfunction is detected.

In the Ready condition, the *READY* button is lighted. The DCT 1700d is automatically placed in a *ready* condition after a tape Cartridge is loaded and an off tape picture is requested.. When *READY* button is pressed, the *READY* button lights, tape is helically threaded, and the Tape Drive can be commanded to immediately enter any other mode.

The Ready mode terminates and tape unthreads from scanner after a prescribed time interval (maximum two minutes). This is called still frame time-out, and prevents tape damage due to prolonged head-to-tape contact. The still frame time-out interval may be changed using the System Setup menu.

Approximately five seconds before time-out, the *STOP* button flashes, warning operator that unthreading is imminent. Press flashing *STOP* button to resume Ready condition and reset time-out interval. After time-out and tape unthreads, *READY* flashes. Press flashing *READY* to place the Tape Drive in ready mode and to re-thread tape and reset the time-out.

REC Mode

5.2.2   Record Mode *REC*

Basic recording procedure consists of

- Setting record inhibit modes.

- Setting analog input audio record levels (if necessary).

- Placing Tape Drive in Record mode.

Setting Record Inhibit Mode

Rec Inhibit

In basic non-edit recording, all record heads are active and all tracks are recorded. Recording on individually selected tracks is considered an editing operation.

To enable recording, perform the following procedure.

1. Press *editor* soft key (located in the upper right corner of the display area) consecutively until Editor mode display in top right portion of screen indicates *insert*.

2. Press *edit* menu button (second button from the left, lower row of the menu & function buttons) Inhibit Status display at the bottom of the display should be indicating that the channels are inhibited and display the label *inhibit* which means it is not armed for recording. The **Video, A1** through **A4, CUE**, and **TC** soft keys directly below the corresponding display should pressed to remove the " *inhibit* " indication arming the associated track for recording. In the upper right corner of the display directly

below the editor status display there is a seven character display area which when all tracks are armed for recording will read as follows: *V 1 2 3 4 C T*

This will indicate the combinations of tracks that will be recorded with each character denoting the corresponding track, *V* = video, *1* = audio track #1, and *C* = cue track, and *T* = time code.

Note 1:   *The other* editor *mode which can be selected is* assemble, *this is used to add on to end of a existing recording. When any track is taken out of the inhibit mode, all of the other tracks will be uninhibited also. The assemble mode requires that all tracks be recorded simultaneously.*

Note 2:   *If soft keys can enable channels, but the unit will not accept the command to edit, which is simultaneous pressing of* **RECORD** *and* **EDIT** *transport controls, check the editor indicator in the upper right corner of the display.*

If this display area of the screen indicates:

MASTER LOCKOUT

Check the master record lockout switch position, located behind front panel, and ensure switch is set to left-hand position to enable record mode. Refer to sections 2.11.3 or 4.1.2 for more details on the location of the Master Record Lockout switch.

If this display area of the screen indicates:

CARTRIDGE LOCKOUT

Eject the loaded video Cartridge and ensure record inhibit plugs are in correct position. Refer to sections 1.3, or 4.1.2, for more details on enabling the video Cartridge for recording.

Setting Analog Audio Input Level

The following procedures set the AES or embedded audio input levels for channels 1-4 & CUE

Note: *The analog operating level is factory preset to +8 dBm. (This can be changed using the procedure described in the Maintenance Manual, Section 6.5.2)*

1. Apply a steady 1 KHz tone at the operating level to selected AUDIO IN connectors.

Audio Setup

2. Verify the audio level meters are set for VU ballistics. (Use *setup*, **INSTALL** menu selection).

3. Press and release **AUDIO INP UNITY** soft key. *unity* indicator should light indicating channel is at unity level, and Channel 1 audio level meter should indicate 0 VU; if necessary, press the **A1 GAIN** soft key and turn adjust knob until the A1 meter indicates 0 VU.

4. Press **A1 GAIN** soft key (to disable the adjust mode).

Tip: *If steady tone is not available, apply program material and turn control knob so that average program level is just below 0 VU, with occasional peaks exceeding the 0 VU mark.*

Note: *The VU scale provides 20 dB of undistorted headroom above 0 VU level, if the operating level is +8 dBm. PPM scale provides 11 dB of undistorted headroom above 9 PPM level and 20 dB above 0 PPM level.*

5. Repeat steps 1 and 2 for channels **A2**, **A3**, and **A4**. and **CUE.**

Note: *Any or all of the "GAIN" soft keys may be depressed to allow two or more channels to be adjusted simultaneously. A good example would be setting the record level for two channels for stereo operation.*

Making a Recording (Non-Edit)

1. Turn the EDITOR **off** .

2. Press **REC** and **PLAY** keys simultaneously to start recording. The indicator in the upper right area of the menu will indicate V1234CT, and all tracks will be recorded

3. Press **STOP** key to stop recording.

Monitoring Recorded Signal during Recording

Recorded signal can be monitored during recording, by playing back the recorded signal just after the signal is recorded (confidence monitoring).

Note 1:   *Monitoring is always record confidence*

1.   Press **e/e** for the e/e mode whether the LED is **on** or not.

Note 2:   *Press and hold e/e button to display e/e video, the e/e mode does <u>not</u> display the input signal.*

5.2.3   **Playback Mode** PLAY

**Play
P-back
Mode**

Playback of recordings can be performed at the following speeds:

• Normal play speed

• Stop motion, including; freeze frame or field.

• Forward/reverse slow-motion at variable speeds, from still to 3X normal play speed forward and 1X play speed reverse.

Video Monitoring

The *input* key allows the input signal to be monitored on the VIDEO MONITOR composite video output only. See section 7 for more detail.

Audio Monitoring
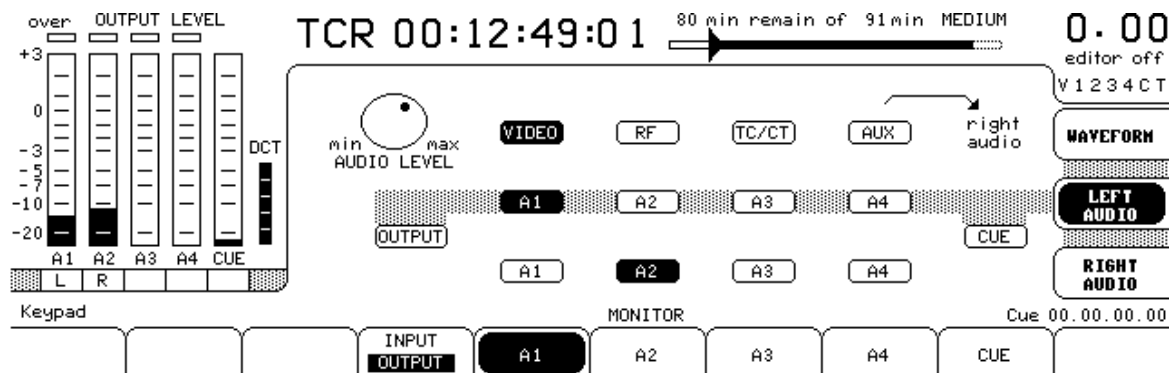
Figure 5.04 Video and Audio Monitoring Menu

An external audio system, consisting of headphones or an amplifier and speakers are used to monitor any two channels. The external system inputs are to be connected to the AUDIO MON connectors at the rear connector panel. Headphones are connected to the headphone jack on lower right corner of the front of the DCT 1700d. The headphone level control is located to the left of the headphone jack.

To monitor the audio channels:

1. Select the *mon* key and then on the monitor menu select **LEFT AUDIO** menu

2. Select the **OUTPUT** monitoring softkey.

3. Press any one **A1** through **A4**, or **CUE AUDIO** channel buttons (middle row). The selected channel(s) can be heard from the left speaker

4. Select the **RIGHT AUDIO** menu

5.   Press any one the **A1** through **A4**, or **CUE AUDIO** channel buttons (bottom row). The selected channel(s) can be heard from the right speaker

Note: *Default is audio monitor L + R = CUE channel in the Shuttle mode. (See AUDIO OUTPUT SETUP menu).*

Adjust audio monitor volume as follows:

**Audio
Setup**

1.   To adjust audio volume on both monitor outputs, turn the knob and the level indicator on the left upper side of the mon menu will indicate knob position and the subsequent level adjustment.

2.   To adjust the audio monitor volume at any time without using the *mon* menu and the display, depress and hold down the *audio* key directly below the knob and adjust the level.

Adjusting Audio Playback Level

The audio playback level can be set using the output gain and output gain bar graphs in the **output** menu display. Audio channels **A1** through **A4** and **CUE** can be set to unity or adjusted to a variable setting as follows:

•   Unity gain: 0 dB

•   Variable gain: – 60 to +14 dB

To adjust the audio output levels and gains:

1.   Press **output** button to select the **OUTPUT** menu.

2.   Press the **GAIN** soft key on the channel to be adjusted.

3.   Reduce or increase the gain with the adjust knob.

Note: *The AUDIO OUT UNITY indication will no longer be highlighted when you move from the unity setting. In addition the LED indicator above the* unity *key will be extinguished. The level which is being adjusted is also indicated numerically in the soft key menu label for the selected gain control.*

A small movable diamond shaped indicator to the right of the audio bar graph indicator will also be highlighted indicating the relative gain setting of the variable level control.

4. Repeat steps 2 and 3 for the other audio channels or the cue channel.

To toggle unity on or off, press the **AUDIO OUTPUT UNITY** soft key. When this key is highlighted, the output gain is at unity; when unity is off, the level is set to the adjusted value. The small diamond shaped indicator remains in position not highlighted to indicate the variable setting. The *unity* key will also toggle the audio system in and out of unity.

Normal Playback

Perform normal playback as follows:

1. Press *PLAY* button to start the playback.

    Pre-recorded material can be viewed on video monitor.

    2. Press *STOP* button to stop playback.

**Stop
Motion**

Stop Motion Playback

A stop motion picture can be produced in two ways: still picture (frame or field) or freeze picture (frame or field). The following paragraphs explain modes of achieving stop motion playback.

Still Picture Playback;

**Still
PBack**

Stopping the tape movement and playing back the same tracks repeatedly produces a still picture. Still picture playback can be initiated through any of four methods:

Note: The e/e *button/indicator must be in tape mode (indicator off).*

Method 1:

Press the *READY* button to place machine in the ready mode, then press the *STOP* button. A still picture will play back for a maximum of 25 seconds before *STOP* button/indicator starts to flash. A flashing *STOP* button/indicator warns the operator that still-picture from tape operation will cease in about 5 seconds.

The following conditions can occur:

- If the *STOP* button is not pressed, tape unthreads, the DCT 1700d Tape Drive enters Stop mode, and *READY* button/indicator flashes.

- If the *READY* button/indicator is momentarily pressed while flashing, still picture playback continues for another 30 seconds.

Method 2:

Press *JOG* button/indicator (lighted). Turn control knob to advance or reverse one frame (or field) at a time. Stop turning the control knob to obtain a still (freeze).

When still picture times out, tape unthreads and *READY* button/indicator flashes. Pressing flashing *READY* button/indicator or turning control knob re-threads tape and resumes still picture.

Method 3:

Press *VAR* button (lighted). Turn control knob until screen displays 00 tape speed (detent position). Tape speed is displayed in upper right portion of display screen. 00 is indicated at still picture position.

When still picture times out, tape unthreads and *READY* button/indicator flashes. Pressing the lighted *READY* button or turning control knob re-threads tape and resumes still picture.

Method 4:

Press button. Turn control knob until screen displays 00 tape speed (detent position). Tape speed is displayed in upper right portion of screen. 00 is indicated at still picture position.

Note: A slight vertical displacement of picture may occur in shuttle mode.

When still picture times out, tape unthreads and *READY* button/indicator flashes. Pressing lighted *READY* button/indicator or turning control knob re-threads tape and resumes still picture.

Press *PLAY* or *STOP* buttons to cancel still picture .

CAUTION: DO NOT PROLONG STOP MOTION
PLAYBACK. PROLONGED CONTINUOUS
PLAYBACK OF ONE FRAME/FIELD MAY
DAMAGE THE TAPE.

Freeze Picture Playback

**Freeze
P-Back**

Freeze picture playback is produced from a frame stored in memory.

Four choices are available in the *home* menu:

- field

- odd field

- even field

- frame

Activating freeze in the Field mode produces at the output the exact field present at the time of the command. Odd Field mode outputs the odd field stored, while Even Field outputs the even field stored. Frame mode produces a full frame output.

1. FRZ MODE = odd

2. Cue to even field and press FREEZE.

3. Cue to odd field and press FREEZE twice.

4. Press FRZ mode to toggle between odd, even and frame.

Note: *To have the fields remain in the frame store, go to setup, and select for video output the setting, video absent mute = **last field/ee***

This feature allows the Tape Drive to be parked on an odd field and an even field freeze initiated, which will store the odd field. The Tape Drive can then be shuttled to another position on tape, parked on an even field, and pressing FREEZE twice will initiated a freeze store the even field. This results in the frame store loaded with two different fields. Toggling the freeze mode selection soft key allows switching between the two stored fields, which allows comparison of two different pictures.

Picture shifts in Freeze mode can occur for the following reasons:

If an off tape field 1 is frozen in **even**.

If an off tape field 2 is frozen in **odd**.

To freeze the picture:

1. Press **FRZ MODE** soft key repeatedly to select field, odd field, even field, or frame freeze.

2. Press **FREEZE** soft key on to freeze picture. The **FREEZE** soft key menu is highlighted indicating that the freeze mode is active.

3. Press **FREEZE** soft key to release the frozen picture.

Variable Speed Playback using Control Knob

Playback speed can be varied by using the control knob as follows:

1. Press *VAR* button.

2. Turn control knob to control play speed. Play speed is indicated as a factor of normal play speed and displayed in upper right corner of display screen.

3. Press *STOP* button to stop variable playback mode.

Vari Speed

Variable Speed Playback using the Keypad

To set variable tape speed :

1. Press *home*, enter any number between -100 and +300 using the keypad and observe the entry in the keypad display register.

2. Press *VAR*.

Note: *The DCT 1700d Tape Drive will playback at the defined percentage of normal speed.*

---

*Example***:**   Enter 72, press VAR, and note that the speed is indicated as .72 in the upper right hand corner of the display.

Control-track-locked Playback Speeds

The drive can be locked to the control track, and material played back at these pre-defined speeds:

–100%:	Normal speed reverse
–50%:	Half normal speed reverse
+50%:	Half normal speed forward
+150%:	One and one half times normal forward
+200%:	Two times normal forward
+250%:	Two and one half times normal forward
+300%:	Three times normal forward

Initiation of control-track-locked playback speeds is performed as follows:

1. From Home menu, enter into the keypad the desired speed as indicated above.

2. Press **VAR**

Note: *The entries for locked speeds are -100,, -50, 50, 150, 200, 250, and 300, while the display shows -1.00, -.50, .50, 1.50, 2.00, 2.50, 3.00.*

5.2.4   Slew Speed Mode

Slew Speed Mode

Tape synchronization can be adjusted to match position on another device.

To use the Slew Speed mode :

1. Initiate **PLAY** mode

2. Continue to hold down the **PLAY** push-button.

3: Rotate the Control Knob clock wise to move the tape forward (forward slew) and Counter- clockwise to move the tape backwards (reverses slew).

5.2.5   Shuttle Mode *‹SHUTTLE›*

Shuttle Mode

Tape can be moved forward or reversed at up to 60X play speed. Shuttle mode produces a recognizable picture at high speeds.

Note: If shuttle is to end of tape, drive stops, unthreads tape (reverting to the co-planar mode), and stays in shuttle mode. Turning control knob in the opposite direction moves and threads the tape out of the end-of-tape area.

To use the Shuttle mode:

1. Press *‹SHUTTLE›* button to place drive in shuttle mode.

2. Turn control knob in either direction to move tape in desired direction at selected speed. Tape speed is proportional to amount control knob is turned, and is indicated in the upper right of the Menu Display and on C/G status line.

3. Turn control knob to center detent position to stop shuttle, or press *STOP*.

4. To cancel shuttle mode, press any of the other transport buttons.

5.2.6   CUE Mode *CUE, SRCH* and *SEARCH TO CUE*

There are two modes for the DCT 1700d to arrive at predetermined points on a tape, they are as follows:

CUE Mode

CUE

The DCT 1700d shuttles the tape to an entry point (timecode number entered into the keypad register minus the preroll set in the system preroll.)
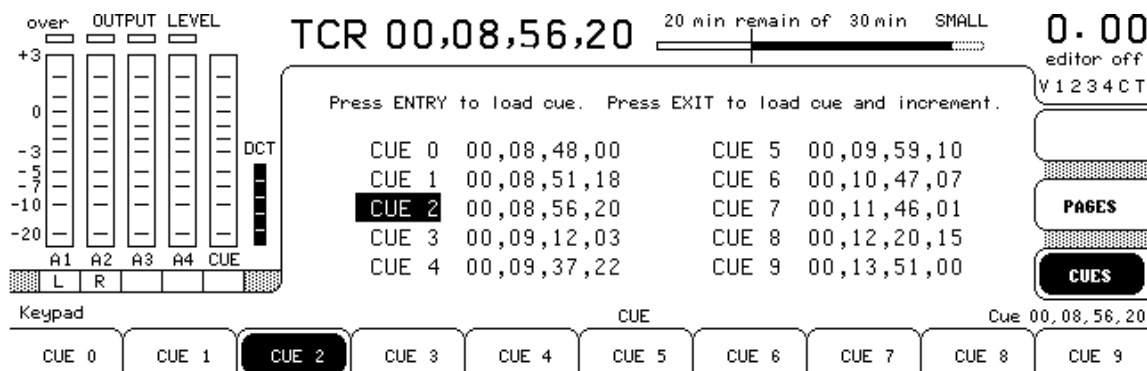
Figure 5.05 First Page of Cue points

Figure 5.05 shows the Display after CUES softkey has been pressed and as cue point number two has been selected, by pressing the CUE 2 soft key.

Press **CUE** button to shuttle tape to entry point minus preroll time.

Note: *The preroll time may be adjusted in the from the setup/system menu. The default preroll time is 5 seconds.*

Note: *If the temporary keypad register is empty, and menu being used is other than* **edit** *or* **SEARCH TO CUE***, the DCT 1700d will not shuttle tape*

Note: *If the temporary keypad register is 00:00:00:00 with a preroll time of 5 seconds the DCT 1700d will shuttle tape to 23:59:55:00.*

SRCH

The DCT 1700d shuttles tape to an entry point and parks exactly on the entry point.

Press **SRCH** button to shuttle tape to entry point.

Note: *Entry points can be set via the keypad, the Edit menu, the Search to Cue menu, or the Cue Log. An Active Cue register holds a single entry, and is available at all times.*

Note: *If the temporary keypad register is empty and menu being used is other than* `edit` *or SEARCH TO CUE, the DCT 1700d will not shuttle the tape*

Active Cue Register:

Edit menu:	When using Edit menus, drive shuttles tape to enabled channels earliest entry point. (Refer to Section 6 for setting edit entry points.)
Cue menu:	When using cue menu, the drive shuttles to the cue point selected by the soft keys at bottom of menu.
Conceal Log:	When using conceal log, the drive shuttles to the concealment selected by the adjust knob.

Search to Cue Menu
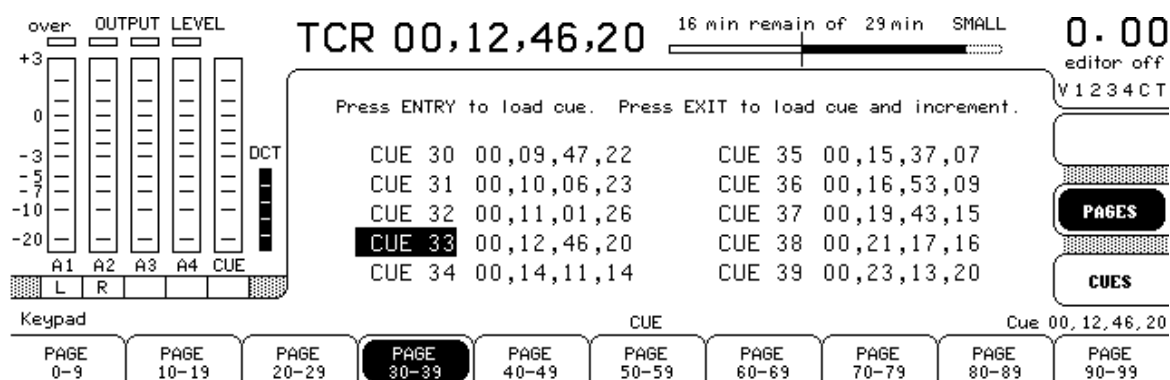
Figure 5.06 Showing access to all Cue points

Figure 5.06 shows the screen after pressing the **PAGES** soft key, and displays additional soft key labels allowing access to the 100 cue points.

To set cue point using the *cue* menu:

1. Press the *cue* push-button.

2. Press the **PAGES** soft key to obtain the screen shown in Fig 5.06.

3. Press the desired **PAGE** group soft key to select the desired page (30-39 shown selected in Fig 5.06).

4. Press the   desired number **CUE** soft key (#33 has previously been selected, followed by a subsequent press of the **PAGES** softkey as in Fig 5.06) to select a cue number. The selected **CUE** becomes highlighted in the data field .

To load a selected cue time into cue number register use one of the following methods:

a. Press *entry* push-button to load cue point from temporary keypad register or current tape time (if keypad register is empty).

b. Press the *exit* push-button to load cue point from temporary keypad register or current tape time (if temporary keypad register is empty) into cue register. Display will automatically advance to next cue point number.

Search to Conceal Log
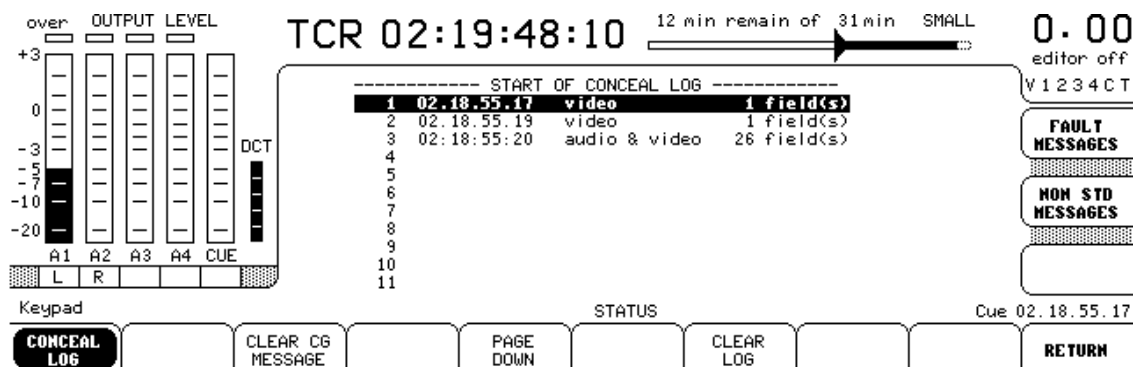
Figure 5.07 Search to Conceal Log

The DCT 1700d will search to any point in the concealment log (See section 7.6 Diagnostics for further information on the concealment log), thereby allowing the operator to view this point and determine whether it was a momentary clog of the PLAYBACK head* or whether it is recorded into the material.

*Note :   Most occurrences appearing in the Concealment log will be of the type mentioned previously (a momentary head clog of a playback head), and will therefore not require any further action.

AMPEX
DCT 1700d

Digital Component Tape Drive

Operation

Editing 6

3

Section 6
Editing

This section instructs the operator on how to use the DCT 700d tape drive to perform stand-up editing procedures, including:

- Prestriping tapes and setting up different start times.

- Setup for both automatic and manual editing.

- Insert and assemble automatic editing,.

- In a machine-to-machine operation.

Section 6   Contents

Section 6 Contents (continued)

6.1   Edit Menu

The Edit menu is used to prepare the Drive for machine to machine editing.
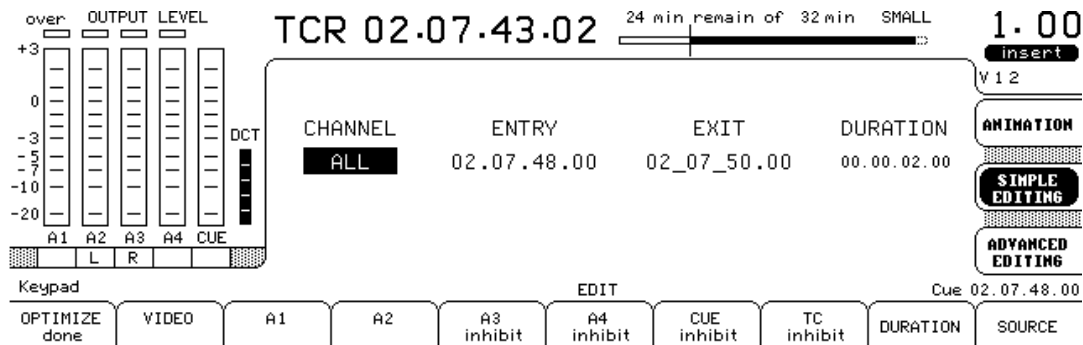
Figure 6.01 Simple Edit Menu

To access the edit menu:

1.   Press *edit* push-button to display Edit menu.

Setting up the Drive for editing includes the following procedures:

- •   Edit optimization

- •   Setting edit preroll and postroll times (previously reviewed in Section 4.4.4)

6.2   Auto Edit Optimization

Auto edit optimization matches the longitudinal control track position and rotary scanner phase of the editing Drive to the recorded material on the tape to be edited. This procedure helps ensure correct alignment of new audio and video tracks with existing tracks of program material.

Edit optimization should be performed when a new record tape is injected into the drive. To ensure optimum performance, it is preferable to initiate the edit optimization procedure at the location on tape at which the edit will take place. It is also suggested that in a long-lasting edit session, that this procedure be repeated periodically at current tape locations.

Unless edit optimization procedure is performed, the message "PERFORM EDIT OPTIMIZE" appears when a cartridge is inserted and the editor is turned on. This message is suppressed after the edit optimization.

Edit optimization can be performed automatically on command from the Home menu or any edit menu.

Perform auto edit optimization as follows:

1. Select *home* or *edit* push-button

2. Press *editor* push-button to select **insert** mode.

3. Press *PLAY* push-button.

4. Press **AUTO OPTIMIZE** soft key. The edit optimization adjustments are performed automatically. The notation **not done** is displayed in the **AUTO OPTIMIZE** soft key window while the optimization is in progress. The notation changes to done when optimization is complete.

6.3   Preroll Optimization

When Preroll Optimize is activated, edit optimization is done completely automatically during the preroll interval preceding each edit entry point. This should only be necessary if the tape to be recorded onto contains several edits performed on different drives. To allow enough time to complete the edit optimization, the minimum recommended preroll interval is 5.0 seconds.

Activate Preroll Optimize as follows:

1. Access **PREROLL OPTIMIZE** soft key on Setup menu as follows:

a. Press *setup* push-button.

b. Press **EDIT** soft key.

c. Scroll the cursor down the Edit Setup portion of the menu to the **INS/ASM PREROLL AUTO OPTIMIZE line.**

    d.   Press the **CHANGE** soft-key to toggle the screen indication on the **INS/ASM PREROLL AUTO OPTIMIZE** line to **on.**

    2.   Proceed to edit in the normal manner.

6.4   Setting Edit Preroll Time

Edit preroll is the amount of time allowed for synchronizing Drives before each edit point.

To set or change the preroll time:

1.   Press *home* push-button, *setup* push-button and **EDIT** soft key.

2.   Scroll the cursor down the Edit Setup portion of the menu to the **EDIT PREROLL line.**

3.   Use keypad to enter preroll time in seconds and frames. For example, if a 3-1/2 second preroll time is desired, enter **03.15**.

4.   Press **CHANGE** soft key in Setup menu to store new preroll time, which is shown on menu to the right of **EDIT PREROLL**

6.5   Setting Edit Postroll Time

Edit postroll is the amount of time the Drive continues to roll after edit exit point.

To set or change the postroll time:

1.   Press *setup* push-button and **EDIT** soft key.

2.   Scroll the cursor down the Edit Setup section of the menu to the **EDIT POSTROLL line.**

3.   Use keypad to enter postroll time in seconds and frames.

4.   Press **CHANGE** soft key in Setup menu to store new postroll time, which is shown on menu after **EDIT POSTROLL**

6.6   Striping Tape

The striping of a tape is facilitated by a simple function located on the home menu under the softkey labeled **STRIPE ENABLE.**

A striped tape may include the following sections, a short section from the start for the tape, with black and timecode (pre-bar area), a section with color bars and tones on each of the audio track and timecode (bar area), and then the remainder of the tape will have black and timecode to the end of the tape. These sections and the relative timecode locations can all be preset in the SETUP menu described in Chapter 4, page 4.38.

Tape Stripe

To stripe a tape:

1. Insert a tape into the drive to be striped

2. Press the softkey on the Home menu labeled:

    STRIPE ENABLE

    The display will indicate:

    PRESS PLAY & REC TO BEGIN STRIPE

3. Press *PLAY* and *REC* at the same time.

    The display will indicate:

    STRIPING TAPE - REWINDING TO START

    If the tape has the record lockout plug set in the lockout position the screen will indicate:

    REMOVE RECORD LOCKOUT FOR STRIPE

The tape will rewind to the start of the tape, and then start recording the pre-bar portion of the tape. The display will change to the status menu, and the concealment log will be active. The upper part of the display will indicate STRIPE, just to the left of the ASSEMBLE edit indication. The machine will make two assemble edits, one at the end of the pre-bar area, (where the edit is made to the bars and tones), the other at the end of the bar area (where the edit is to the black). Upon completion of the striping, the DCT 1700d will be rewind to the head of the tape. It will then partially eject at this point when the cartridge time out is completed. At this point a *play* or a *ready* command will pull the tape back into a loaded condition.

6.7   Automatic Editing

Automatic editing permits the operator to perform the following operations:

- Select insert or assemble editing.

- "Edit-on-the-fly," where selected edit points are determined by monitoring source and record video, using edit entry and exit controls.

- Timecode edit, where keypad is used to enter or transfer timecode to edit entry, exit, or duration registers.

Auto Edit

- Trim edit and entry points to frame accuracy.

- Preview an edit by rolling both source and record machines.

- Perform combine edits, where audio and video entry and exit points are the same.

- Perform split edits, where audio and video have different edit points.

- Review an edit by re-cueing and rolling the record machines.

You can perform automatic insert and assemble editing, using the Edit menu and the editing and transport controls. When the Edit menu is used, incoming video and, or audio plus timecode can come from two sources:

1. An external, uncontrolled, continuous source, such as an uncontrolled Drive or camera

2. A controlled source, such as a controlled Drive in a machine-to-machine control configuration

When editing with an uncontrolled continuous source, select record entry and exit points for the record machine only; the external equipment must be operated independently.

When editing with a controlled source in a machine-to-machine control, the DCT 1700d record drive is connected to a source machine via the RS-422 interface connector.

In a machine-to-machine configuration (single-source editing system) the DCT 700d control panel becomes the edit controller from which selected edit entry and exit points and transport functions (*play, shuttle, jog*) on both machines are controlled.

6.8   Operator Messages

Operator messages are displayed in the dedicated area of the display screen, to alert the operator of editor status or unusual conditions. These messages are displayed in the main data display area of the screen.

Table 6.1 lists all the messages, defines their meaning, and recommends the course of action to take in response to the message.

Table 6.1. Operator Messages

Message	Meaning	Suggested Action
EDITOR OFF	Edit mode is turned off.	Go to the *editor* push-button and select **insert**, or **assemble** mode.
INCORRECT EDIT MODE	Editor not in insert mode; cannot do split edit in assemble mode.	Go to the *editor* push-button and select **insert**, or **assemble** mode.
DROP FRAME MIX (525 Line Only)	Full-frame and drop-frame mix in edit points or timecode reader.	Insure all edit points and tape positions are all full-frame or all drop-frame.
OPEN ENDED EDIT	No edit out-time assigned to **EXIT** register.	Enter exit time unless open-ended edit is desired.
WARNING – SPLIT EDIT	Changes were made in the **ADVANCED EDITING** display (refer to Figure 3-8, Sheet 3).	Press **ADVANCED EDITING** soft key and check audio/video edit points.
NO VALID ENTRY	No edit points are entered on disabled channels.	Enter entry and exit for enabled channels or enable a disabled channel that has an entry point.

6.9   Selecting Assemble or Insert Modes

Before editing, the operator must select one of three edit modes: assemble, insert, or selsync.

- In assemble mode all channels (video, audio, analog cue, control track, and timecode) are edited simultaneously. Assemble mode should be used where additional assemble-edits will follow to complete program. or at the end of a program . An assemble edit controls only the entry point of the edit and more material must be recorded than is needed to allow space for the next assemble edit. An assemble edit must start before the end of the previous recording to allow the drive to lock to the previous control track and preset the circuitry that will record the new control track in the assemble edited portion. This method does not require any previous recording on the tape.

- In insert mode the desired channels, including timecode channel, can be edited. Video signal and/or audio, cue and time code are inserted between the edit in- and out-points. This mode must have a continuous base recording on tape, i.e.; a pre-striped tape with color black recorded on it from beginning to end..

To select assemble or insert,:

1. Press *editor* push-button in the upper right corner of the menu display panel repeatedly to select mode:

   - insert

   - assemble
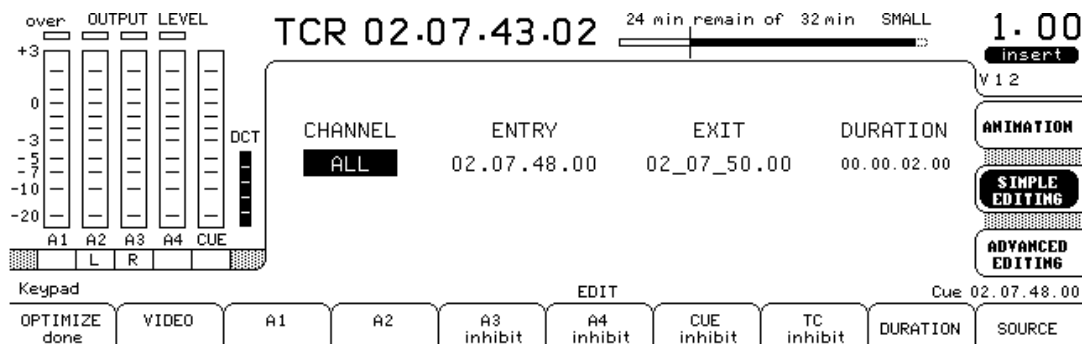
Figure 6.02 Simple Insert Edit

Note: *Mode is indicated in soft key window and in dedicated area at top right corner of the display.*

6.10 Selecting Channels to be Edited

In basic non-edit recording, all record heads are active and all tracks are recorded. Recording on individually selected tracks is considered an editing operation.

To enable recording, perform the following procedure.

1. Press *editor* soft key (located in the upper right corner of the display area) consecutively until Editor mode display in top right portion of screen indicates *insert*.

2. Press *edit* push-button. The **Video,** audio channels **A1** through **A4, CUE**, and **TC** soft keys directly below the corresponding display should be pressed to remove the *inhibit* indication as desired, thereby arming the associated track for recording.

Note 1:   *There is a seven character display area directly below the editor status indication, which will indicate those channels that are currently enabled. The display will indicate the combinations of tracks that will be recorded with each character denoting the corresponding track, V = video, 1 = audio track #1, and C = cue track, and T = time code.*

Note 2:   *The other editor mode which can be selected as* assemble, *is used to add on to end of a existing recording. The assemble mode requires that all tracks be recorded simultaneously, just as the basic non-edit recording process, however the new material will be seamlessly appended to the end of the existing material.*

Note 3:   *If soft keys can enable channels, but the unit will not accept the command to edit, which is simultaneously pressing of* RECORD *and* EDIT *transport controls, check the editor indicator in the upper right corner of the display.*

If the display indicates:

MASTER LOCKOUT

Check master record lockout switch position, located behind the front panel, and ensure switch is set to left-hand position to enable record mode. Refer to Sections 2.11.3 or 4.1.2 for more details on enabling videocassette for recording.

If the display indicates:

<div align="center">CARTRIDGE LOCKOUT</div>

Eject loaded video cartridge and ensure record inhibit plugs are in correct position. Refer to Sections 1.3 or 4.1.2 for more details on enabling videocassette for recording.

When assemble mode is selected, all the channels are automatically selected.

When enabled for edit recording but not in the record mode, the record inhibit status display looks like this:
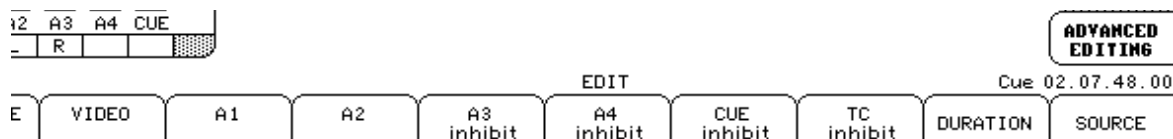
<div align="center">*Figure 6.03*</div>

When in edit-record mode, display looks like this:
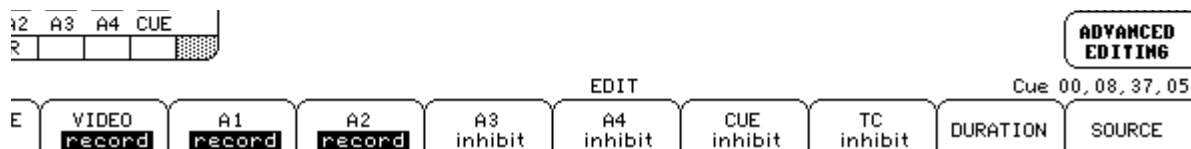
<div align="center">*Figure 6.04*</div>

6.11 Selecting Source Drive and Setting Edit Points

To perform machine-to-machine editing, connect source Drive (player) to the RS-422 port 1 or 2 of the DCT 700d (recorder). See Section 4.6 for instructions how to set the proper remote protocol. The control panel of the record Drive will remotely control source Drive. To select source Drive, press **SOURCE** softkey.

On the source drive (or Drive) use the setup menu and set up the connected remote port for the ASMPTE protocol, and then activate the remote function by depressing the Remote (*rem*) 1 or 2 push-buttons

To control selected source Drive:

1. Press *edit* push-button: displays the Edit menu.

2. Press **SOURCE** soft key to highlight function.

3. Press either **SOURCE ON PORT 1** or **SOURCE ON PORT 2,**
    to select the port which is connected to the source machine.

Note: *This soft key is always displayed, but is not highlighted if no source Drive is connected. Also, source Drive status information is not shown in display panel unless source Drive is connected.*
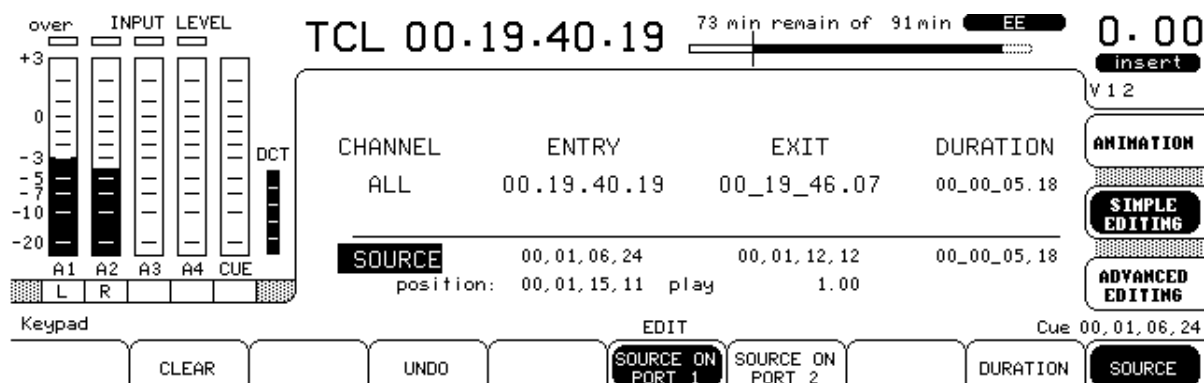
Figure 6.05 Source Drive selection

The source edit data will appear as shown in Figure 6.6. Note that when control of source Drive is selected, all soft key functions will disappear except SOURCE Drive CONTROL and **ENTRY** push-button.

Source data is defined as follows:

SOURCE: Current mode of source Drive Speed (stop, play, shuttle, etc.).

POSITION: Current timecode position of source Drive.

ENTRY: Edit in-time using *entry* push-button to enter time from current position of source Drive or keypad.

EXIT: Edit out-time using *exit* push-button to enter time from current position of source Drive or keypad.

DURATION: Length of edit (between entry and exit points), which can be entered with keypad.

Note: *To perform an edit only two of the three pieces of information about the edit are required. The drive will calculate the third portion .*

Use the controls on the record Drive's control panel to control the source Drive:

- *Cue*   • *Jog*

- *Search*   • *VAR*

- *Ready*   • *<SHTL>*

- *Stop*   • The Control Knob

- *Play*

6.12 Setting Record Drive Edit Entry and Exit Point

For record-only or machine-to-machine editing, edit point values maybe derived from the following sources:

- Tape timer/timecode position of record Drive

- Numeric keypad entry

- Transfer from another edit point register

- Tag (record Drive only), where exit point from last edit is automatically transferred to entry point of current edit

Set Edit Exit Pt

- Recall (record Drive only), where edit points from the last edit recorded on tape are restored

6.13 Setting Entry or Exit Point to Current Tape Time

Note: *DCT 700d Component Digital Tape Drives have three tape time modes: This information is a repeat of Section 4.3.2*

- Full-frame tape time mode displays tape times with colons or periods as time unit separators. Example:

  23:59:59:00 (even field)   **23.59.59.00** (odd field)

- Drop-frame tape time mode displays tape time with semi-colons or commas as time unit separators. Example:

  23;59;59;00 (even field)   **23,59,59,00** (odd field)

- Invalid mode displays tape times with asterisks as time unit separators. Example:

  23*59*59*00 (all fields)

Table 6.2 Time Unit Separators

Tape Time Mode	Odd Field	Even Field
Full Frame	.	:
Drop Frame	,	;
Invalid	*	*

Set entry or exit point to current tape time as follows:

1. Shuttle tape to desired edit in location using the control knob. Make small adjustments to tape position in the jog mode.

Note: *Temporary keypad register must be cleared. If necessary, clear field by pressing* **C** *button on keypad.*

2. Either press **entry** push-button to transfer current tape position to ENTRY register, or press **entry** push-button while tape is moving to specify edit in-points on-the-fly.

3. Shuttle tape to desired edit out-point using control knob. Make small adjustments to tape position in the jog mode.

4. Either press **exit** push-button to transfer current tape time to **exit** register, or press **exit** push-button while tape is moving to specify edit out-points on-the-fly.

Note: *If edit exit is omitted, the Drive will perform an open-ended edit, where the edit is terminated by pressing either the* **exit** *or* **stop** *push-button.*

Edit duration's are automatically calculated and displayed in the **DURATION** register.

Note: *To perform an edit any two of the three pieces of information,(* **entry, exit,** *or* **duration** *) about the edit are required. The drive will calculate the third portion .*

6.14 Setting Entry and Exit Points with Keypad

Set entry and exit points with keypad as follows:

1. Enter edit point value with keypad in hours, minutes, seconds, and frames. Use the *F* key in the keypad to select field (if needed). Values will be displayed in the temporary keypad register.

2. Press *entry* or *exit* push-buttons to transfer value in temporary keypad register to *entry* or *exit* data register.

6.15 Transferring Edit Point Value from One Register to Another

Transfer edit point value from one register to another as follows:

1. Press *T* key on keypad. The temporary keypad register will display:

                    TRANSFER

2. Press *entry* or *exit* push-buttons to copy edit point value to temporary keypad register.

3. Press *entry* or *exit* push-buttons to transfer temporary keypad value to *entry* or *exit* register.

6.16 Transferring Cue Point Value to Edit Point Data Field

Transfer cue point value to edit point data field as follows:

1. Press *CUE* push-button to bring up the Cue menu.

2. Press **T** key on keypad. The temporary keypad register will display:

<div align="center">TRANSFER</div>

3. Activate desired cue point by pressing **CUE** (**0** through **9**) soft key, or using **PAGE** to select cue page (PAGE 0–9 through PAGE 91–99).

4. Press the **edit** push-button to return to Edit menu.

5. Press **entry** or **exit** push-buttons to transfer value in temporary keypad register to **entry** or **exit** data register.

6.17 Setting Edit Duration

**Set
Edit
Dur**

Edit duration is automatically calculated and displayed when entry and exit points are specified, or entered manually using the keypad.

To manually enter the edit duration:

1. Enter edit duration with keypad:

    •   Hours, minutes, seconds, and frames.

    •   Only frames (up to 99) by initially entering the two digit value only, which will display 30 in 525 line mode (25 in 625 line mode) to 99 frames as seconds and frames.

2. Press **DURATION** soft key to transfer value from temporary keypad register to DURATION register.

Note: *If entry time is shown, exit time is calculated. If entry time is clear and exit time is shown, entry time is calculated.*

6.18 Previewing Edit

The preview capability allows a proposed edit to be viewed and/or heard as it would appear when recorded on tape. Edit point locations may be checked and modified, if necessary, before the edit is recorded.

Edits are previewed by pressing **PREV**. Once **PREV** is pressed, the drive cues, rolls, synchronizes, then shows recorded material on record machine up to the edit point. At edit point, machine goes into *e/e* mode and shows playback material supplied from the source.

Prev Edit

Preview mode terminates after exit point at postroll and goes into the stop mode.

If an insert edit is being performed and no exit point is specified, an exit point can be put in at any time during preview by pressing the *exit* push-button. That point is entered as the exit point and the preview is completed.

6.19 Trimming Edit Points or Edit Duration

The trim operation allows the edit point or duration to be changed before recording.

Trimming of edit points or duration is performed as follows:

Trim Edit

1. On the keypad, press either + or – buttons, depending on whether the edit point or duration value is to be increased or decreased.

2. On keypad, enter amount the edit point or duration is to be trimmed. Values up to 99 will be displayed as a frame count.

3. Press *entry*, *exit,* push-buttons or **DURATION** soft key to apply the trim value.

6.20 Performing the Edit

Press *RECORD* and *EDIT* buttons simultaneously to record an edit. During the recording of the edit, the following events take place:

> *EDIT*, *CUE*, and *<SHTL>* push-button/indicators light until the drive is cued.

> *RECORD* and *PLAY* push-button/indicators light when cued.

> The *PLAY* push-button/indicator goes out when entry point is reached.

Note: *Video and Audio confidence playback from tape is display and/or heard during the edit.*

> *PLAY* push-button/indicator lights again when the exit point is reached.

> *RECORD* and *EDIT* push-button/indicators go out at end of the postroll.

**Rec
Edit**

6.21 Reviewing Edit

Press *REV* to review the edit. Tape automatically cues to entrance point with preroll and plays back the edit.

**Rev
Edit**

6.22 Recalling Last Edit Made

The **RECALL** soft key is located on the ADVANCED EDITING MENU.

To access the RECALL command, press the **ADVANCED EDITING** soft key from the *edit* menu.

Press **RECALL** soft key to clear the active edit times from the screen, and load the last edit made.

> *Note:*   *If active edit is the first edit, recall function will clear all entries. If necessary, press UNDO soft key to restore active edit times.*

6.23 Selecting the Auto Tag mode

The AUTO TAG mode will automatically transfer last edit out-point to next edit in-point immediately after the edit recorded. If the edit must be redone use RECALL to recall the edit just completed.

Auto Tag

Select AUTO TAG mode as follows:

1. Access AUTO TAG selection on Setup menu as follows:

   a. Press *setup* push-button.

   b. Press **EDIT** soft key.

   c. Scroll the cursor down the Edit Setup portion of the menu to the AUTO TAG **line.**

   d. Press the **CHANGE** soft-key to toggle the screen indication on the AUTO TAG line to **on.**

6.24 Basic Machine-to-Machine Auto-Editing Procedure

Use the following procedure for open-ended "on-the-fly" or timecode combined edits. The transport controls on the record machine are used to position tapes on the source machine and the record machine. Entry points are entered from positioned tape or moving tape (on-the-fly) when *entry* push-button is pressed.

Basic machine-to-machine auto-editing is performed as follows:

1. Setup record and source machines for remote control. Load tapes and make sure valid timecode is present. The tape timer can also be used if desired.

2. Clear all entry and exit points using **CLEAR** soft key from Edit menu.

Note: *REMOTE 1 or 2 buttons must be lighted on the source drive.*

3. Press **SOURCE** soft key (highlighted) to select source Drive.

4. Set source Drive edit in-point in one of two ways:

    a. Position tape on source Drive at first edit in-point, using transport controls on record machine while watching either video monitor or listening to the audio monitoring system or tape position on display screen, then press *entry* push-button to mark edit in-point.

    b. Enter desired timecode value on keypad, then press *entry* push-button.

5. Press **SOURCE** soft key, removing highlight and selecting record Drive.

6. Set record Drive edit in-point in one of two ways:

    a. Position record tape at first edit in-point, using transport controls on record machine, then press *entry* push-button to mark edit in-point.

    b. Enter desired timecode value on keypad, then press *entry* push-button.

7. Press *PREV* button to preview the edit.

8. Press *CUE* button to shuttle tape back to edit in-point minus preroll (optional step).

9. Press *RECORD* and *EDIT* buttons simultaneously to record the edit. Press *STOP* button to terminate edit and mark the edit out-point.

10. If desired, press *rev* button to review the edit.

Note: *If **AUTO TAG** is selected on the **setup** menu under* **EDIT***, the exit points for the completed edit now appears as the entry points for the next new edit.*

6.25 Split Edits (insert mode only)

The DCT 700d Drive performs split edits, which are edits that have different entry and exit points for the audio and video channels. Split edits can be split between the video channel and all audio channels combined,

Split Edit

Fig 6.06 Split Edits

Perform split edits as follows:

1. Press **edit** push-button to select the Edit menu.

2. From the **edit** menu press the **ADVANCED EDITING** soft key.

3. Select either VIDEO or AUDIO to select the desired entry or exit information either to the Video or Combined Audio portions of the display

4. Set edit points using **entry** and **exit** push-buttons or the **DURATION** soft key (refer to paragraphs 6.16 through 6.23).

Example:

The following procedure is an example of a typical split edit performed at the entry point for the record Drive:

1. From Edit menu, press **ADVANCED EDITING** soft key. This displays the video and audio channels.

2. Select VIDEO channel using the **MODIFY VIDEO** soft key.

3. Enter or trim entry time for video channel using keypad.

4. Select audio channels A1-4 using **MODIFY AUDIO** soft key.

5. Set (or trim) entry time for **audio** channels using keypad. Set entry time later or earlier than video channel entry point.

6. Press *PREV* button to preview edit.

6.26   Manual Editing

Manual editing is done without the benefit of preset edit points, duration, or preview feature. The operator monitors source and record video and /or audio and makes edits, using mostly transport controls with minimal use of edit menus.

Perform manual editing as follows:

1. Press **editor** push-button repeatedly to select insert or assemble**.**

2. If insert editing is selected, press the **edit** push-button to display the edit menu and enable the desired channels.

3. Move tape to a location slightly ahead of the proposed edit using the transport controls.

4. Press *PLAY* and *RECORD* buttons simultaneously (both buttons light). View the monitor and, or listen to the audio to determine where to begin the edit.

6. When tape reaches desired location, press *EDIT* button to begin recording edit. The *RECORD* button remains on and *PLAY* button turns off.

Note: *In the* **edit** *menu, a single channel, if enabled, may be edited by toggling the channel soft key into and out of record mode.*

7. To terminate the edit, press *EDIT* or any transport command button.

6.27 Animation Editing

Animation is a special editing function. The DCT 1700d tape drive can accurately perform edits that are as short as one field in duration, and is able to record a series of still pictures, it therefore can produce animated sequences. The Animate menu simplifies this process of sequentially recording stills.

The cell size is the duration between each edit entry point (for example, every 10 frames), which is used to maintain a constant rate during the recording sequence. The **5 FIELD** soft key (525 only) is used to set the cell size to five fields. The **FILM 3/2** soft key (525 only) is used to alternate cell size between two fields and three fields for each edit. This allows the Drive to synchronize with the 24 frames-per-second speed typically used for motion picture film. The 25-fps 625 frame rate typically does not require alternating cell sizes.
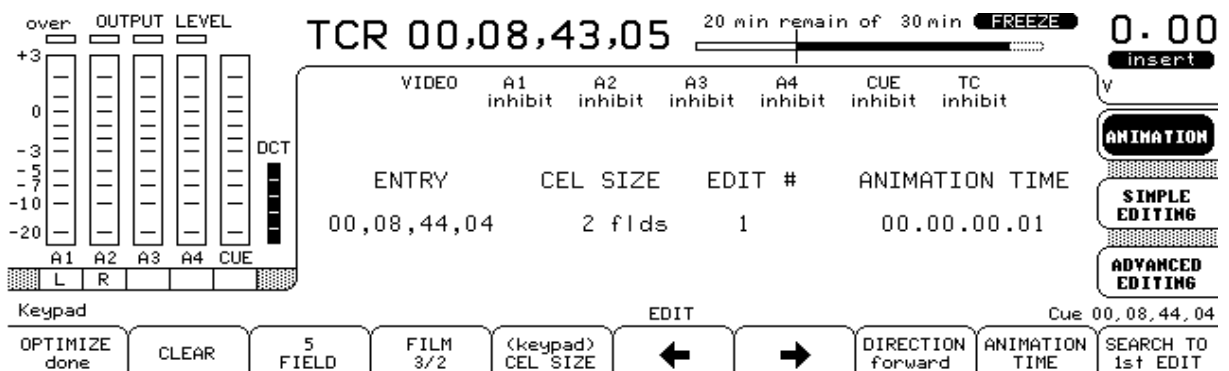
Figure 6.07 Animation Editing

Set the ANIMATION PREROLL as follows:

1. Access ANIMATION PREROLL selection on Setup menu as follows:

    a. Press *setup* push-button.

    b. Press *edit* push-button.

    c. Scroll the cursor down the Edit Setup portion of the menu to the **ANIMATION PREROLL** line**.**

    d. Using keypad, enter animate preroll time into the keypad register.

Note: *A minimum 1 second ANIMATION PREROLL is recommended.*

    e. Press the **CHANGE** soft-key to enter the keypad value into the **ANIMATION PREROLL** selection window.

Animation editing is performed as follows:

1. Press *edit* push-button to bring EDIT menu.

2. Press *editor* push-button repeatedly to select insert or assemble mode. If insert mode is selected, press **VIDEO** soft key to enable video channel.

3. Press **ANIMATION** soft key to bring up the Animate menu.

4. If this is a first edit, perform **EDIT OPTIMIZE** then press **CLEAR** soft key to clear all previous edit information from screen.

5. Set entry point for beginning of animated sequence. Entry point can be set in two ways:

    a. Move (shuttle or jog) tape to desired entry point then press *entry* push-button to transfer tape time or timecode to *entry* register.

    b. Enter valid tape timer or timecode, using numeric keypad; then press *entry* push-button to transfer number to *entry* register.

6. Set cell size using one of the following methods:

    a. Press **5 FIELD** soft key to set cell size to five fields. **CEL SIZE** register will display:

                5 flds

        This indicates that two frames and one field (five fields) have been entered.

    b. Press **FILM 3/2** soft key to alternate cell size between two fields and three fields for each edit. **CEL SIZE** register will display either

                3 flds

        Indicates that five fields have been entered, or

    c. If a one-field cell is used for animation, enter a one-field cell in the **CEL SIZE** register as follows:

        Press the 0 key on keypad. Note that **00** appears in the temporary keypad register. In drop-frame, a comma precedes 00; in full frame a period precedes 00. Press F (field) to show either a semi-colon or colon.

        Press **CEL SIZE** soft key to transfer value in temporary keypad register to **CEL SIZE** register. This establishes the one-frame cell. **CEL SIZE** register will display:

                     1 flds

    d. Cell size can be established as an odd number of fields (any number of frames plus an additional field). Enter an odd-field cell in **CEL SIZE** register as follows:

        Enter number of full frames desired in cell, using keypad.

        Press the *F* (field) key on the numeric keypad to add a field to number of frames indicated. Note that in drop frame, after pressing *F* key, comma is replaced by a semicolon; in full frame, period is replaced by a colon.

        Press **CEL SIZE** soft key to transfer value in keypad register to **CEL SIZE** register. This establishes odd-field cell length.

7. The **ANIMATION TIME** register keeps track of amount of animation done. It is normal at start of animation sequence for register to indicate zero. Press zero on keypad, then press **ANIMATION TIME** soft key.

Alternately, if some period of animation is already on tape, this period can be entered into **ANIMATION TIME** register from keypad.

8. Press *EDIT* button to perform the animation edit. When the buttons is pressed, the Drive

    a. Searches to entrance point minus preroll time,

    b. Prerolls,

    c. Performs edit at entry point,

    d.   Searches back to new entry point minus preroll time.

9. After animation sequence is complete, each recorded cell can be viewed cell by cell using the ← and → soft keys.

    The → soft key scrolls forward one cell.

    The ← soft key scrolls backwards one cell.

When the above keys are used, **ENTRY**, **CEL SIZE**, **EDIT #**, and **ANIMATION TIME** registers are scrolled up and down accordingly, and the Drive cues to each new entry point.

Note: *The Animation Edit mode can also act as a simple animation controller when it is interfaced with some graphics devices or workstations. On the parallel remote connector (see DCT 700d Getting Started Manual) there are connections available to allow the Animation edit mode to "handshake" with the graphics device via a simple general purpose interface (GPI). The connections include pin # 23, REMOTE EDIT and pin #24 EDIT DONE and pin # 13 GND. The first edit is initiated by a contact closure between pin 23, REMOTE EDIT and pin 13, GND and the DCT 1700d will perform the first edit of the animation session. When this edit is completed the DCT will provide a similar contact closure between pin 24, EDIT DONE and GND. This command allows the graphics device to create the next cell before commanding the DCT 700d to make the next recording. Not all graphics devices can be interfaced in this manner, but if the one you are working with can this may save the cost of an additional Animation Controller.*

Sel Sync

6.28 Audio Advance (Sel Sync Operation)

The DCT 700d Series Drive automatically enters a preset audio output clock advance value whenever the SEL-SYNC mode is selected. (see the glossary for a detailed description of the SEL-SYNC mode)

This value produces perfectly timed SEL-SYNC audio edits when a reasonably short direct cable connection is made between the analog audio outputs and inputs. The *setup* menu can be used to enter other clock advance values to satisfy different requirements.

Note: *1clk = 1 cycle @ 48 Khz = 20.8 micro seconds.*

Set the SEL SYNC ADVANCE CLOCKS as follows:

1. Access the AUDIO OUTPUT selection on Setup menu as follows:

   a. Press the **_setup_** push-button.

   b. Press the **AUDIO OUTPUT** soft-key.

   c. Scroll the cursor down the AUDIO OUTPUT portion of the menu to SELSYNC ADVANCE CLOCKS

   d. Using the Control Knob enter the desired amount of audio advance from the audio input being used.

Note: *The range of advance is different for the three methods of outputting audio from the drive, analog 82, embedded 134, and AES 142. Each step is 1 cycle of the 48 KHz clock or 20.8 micro seconds.*

2. Activate the SEL-SYNC mode.

   a. Turn on the INSERT edit mode with the **_editor_** push-button.

   b. Press the **_edit_** menu select push-button

   c. On the EDIT menu select ADVANCED EDITING

   d. Select AUDIO SELSYNC

   e. The INSERT mode indicator will change to selsync.

Note: *If the EDITOR is not in INSERT, the SEL-SYNC soft key is not on the menu.*

   f. Perform the selsync edit by following the same steps for an insert edit.

AMPEX
DCT 1700d

Digital Component Tape Drive

Operation

Section 7
Diagnostics

This section covers the diagnostics for the DCT 1700d Digital Component Tape Drive, including real time diagnostics and system fault detection. Comprehensive lists of fault and non standard conditions are included for early detection of a condition. This section also includes detailed explanation of the use of the concealment log and typical waveforms for the RF envelope, Timecode and Control Tracks.

Section 7 Contents

The following topics are discussed:

- Operator messages and soft key functions
- Diagnostics menu set
- Control panel diagnostics
- Power and air supply monitoring
- Servo diagnostics
- Waveforms monitoring
- Signal system diagnostics
- Transport diagnostics

No special tools are required for diagnostics. To access the diagnostics menu, press the *audio* button and softkey immediately below the *editor* softkey simultaneously. Refer to figures 2.02 & 2.04 for location. To disable the diagnostics menu, press the *home* button, then the *audio* button and softkey immediately below the *editor* softkey simultaneously. After pressing home the disabling softkey will indicate DIAG, which will disappear when disabled.

7.1   Operator Messages

Operator Msg

Operator messages appear in the top left corner of the display screen and alert the operator of system fault(s), nonstandard operating modes in effect, or message modes set by the operator. Table 7.1 defines the various operator message displays.

Table 7.1 Operator Message Display

Display	Meaning
Highlighted **F**	Alerts operator that one or more system faults are active.
Highlighted **N**	Alerts operator that nonstandard condition(s) exists.
Highlighted **L**	Alerts operator that one or more fault or nonstandard messages in latch mode have occurred.

Note: *Qualified maintenance personnel should be informed whenever a system fault message appears on the display screen.*

7.2 Message Status and Mode

The status column in the Status menu display indicates pass or fail. The pass status indicates normal operation. The fail status indicates a fault condition.

The status column in the Status menu display indicates STD or NONSTD. The std status indicates the selected setup is in the standard mode. The NONSTD status indicates setup is intentionally or unintentionally in the nonstandard mode.

The status message for each fault condition may be set to one of three modes: normal, inhibit, or latch.

7.2.1 Normal Mode

Normal Mode

In normal mode, the fault message is displayed when that particular condition occurs and has the highest uninhibited priority.

To place a message in normal mode:

    1. Turn the adjust knob to select message (highlighted).

    2. Press **NORMAL** soft key on Status menu.

7.2.2 Inhibit Mode

Inhibit Mode

Inhibit mode prevents a message from being displayed. Typically, inhibit mode is used when the operator is aware of the condition but does not want the accompanying message displayed.

To place a message in inhibit mode:

    1. Turn the adjust knob to select message (highlighted).

    2. Press **INHIBIT** soft key on Status menu.

To remove a message from the inhibit mode, press NORMAL or LATCH soft key.

When any item has been inhibited, the **INHIBITED MESSAGES** soft key is displayed. When this key is pressed, a list of all inhibited messages is displayed.

Latch Mode

7.2.3   Latch Mode

In latch mode, the status message continues to be displayed after the fault condition becomes inactive.

To place any fault message in latch mode:

    1. Turn adjust knob to select message (highlighted).

    2. Press LATCH soft key on Status menu.

Use latch mode to detect transient fault conditions. For example, assume that a short segment of tape is suspected of having a missing or bad timecode and the display cannot be monitored during play mode. Set the message Bad or no timecode to latch mode. When the bad timecode is detected, a highlighted L appears, and the message continues to be displayed after the fault condition is cleared.

Msg Count

7.3   Message Count

The COUNT column indicates the number of times a fault condition occurs. Note that transport-related system faults (such as Control Track Not Locked) must be active for several seconds before being counted. This delay also applies to the fault messages displayed on the status line of the C/G in the video monitor output.

To reset count to zero:

    1. Turn adjust knob to select message (highlighted).

    2. Press **ZERO COUNT** soft key on Status menu.

    3. Press ZERO ALL COUNTS to zero all fault message counts.

Non Std Mode

7.4 Nonstandard Mode Messages

Non standard messages are presented since some of the messages could be helpful in diagnosing a problem. They are also listed in the Maintenance Manual.

Highlighted **N** in the upper left corner of screen indicates system is operating in a nonstandard mode. Use procedures in Section 4 to set standard and nonstandard modes.

Nonstandard operation can be intentional or inadvertent. If nonstandard operation is inadvertent, the message (N) warns the operator to make the necessary changes to the DCT 1700d's setup. If nonstandard operation is intentional, the message reminds the operator to make the necessary changes to the system setup at the end of the play or recording session.

To view current list of activated warning messages, press the **STATUS** soft key from Home menu.

To display complete list of nonstandard mode messages:

1. Press **STATUS** soft key.

2. On Status menu, press **NON STD MESSAGES** soft key.

3. Turn the adjust knob to scroll list and select nonstandard mode message (highlighted). The following message indicates beginning of list:

<div align="center">- START OF NONSTD LIST -</div>

Table 7.2 lists the nonstandard mode messages in alphabetical order. The displayed message is shown in bold-face type. The first bullet item under the message defines or explains the message. The second bullet item provides suggested check procedures or actions for the operation or service personnel, though other actions might be necessary.

Table 7.2 System Nonstandard Mode Messages

Message	Meaning	Suggested Action
AES Ch 1 2 signal ABSENT	No signal is connected to AES AUDIO IN 1, 2 jack.	Check connection at rear panel. Check source selection in setup/VIDEO INPUT menu. Refer to service personnel.
AES Ch 3 4 signal ABSENT	No signal is connected to AES AUDIO IN 3, 4 jack.	ditto
Air filter DIRTY	Output filter on air system is clogged.	Check air filter.
Air pressure WARNING	Air pressure is not within normal operating limits, indicating possible problem.	Check air paths and air filters.
AST NOT standard	AST is in frame mode or off.	Check System Setup menu display. Typical setting is field.
AST Track curve OFF	Track curvature feature of AST is disabled.	Use *home*/DIAG/TRANSPORT/AST TRACK CURVATURE to enable track curvature. Refer to service personnel.
Audio advance ACTIVE	Audio output signals are advanced.	Check *Setup*/AUDIO OUTPUT menu.
Audio mute OFF	Monitor audio muting is set to off.	Check *Setup*/AUDIO OUTPUT menu.
Audio test generator ON	Audio test generator is selected.	Check *Setup*/AUDIO INPUT menu. Standard setting is off.
Auto Edit Optimize ERROR	Edit optimize not within tolerances.	Try to Edit Optimize again. Refer to service personnel.
Capstan Current HIGH		Refer to service personnel
Cartridge time out	Cartridge has been ejected at expiration of selected interval in which there has been no activity of the drive.	Use Cartridge **TIMEOUT** soft key (on setup menu) to change time-out or hit any key on a machine controller (if connected).
Concealment OFF	ERROR CONCEALMENT disabled	Go to *home*/DIAG/SIGNAL SYSTEM/VIDEO menu and turn to ON.
Correction C1 OFF		Go to *home*/DIAG/SIGNAL SYSTEM/VIDEO menu and turn to ON. OFF in e/e

Table 7.2 System Nonstandard Mode Messages (Continued)

Message	Meaning	Suggested Action
Correction C2 OFF		Go to *home*/DIAG/SIGNAL SYSTEM/VIDEO menu and turn to ON. OFF in e/e
EOT during play WARNING	DCT 1700d detects EOT signal during Play modes.	Cleared by any transport command except *STOP*. Move tape away from end.
Equalizer in manual	Automatic operation of playback equalizer is disabled.	Set **EQUALIZER MODE** soft key (on equalizer setup menu) to Auto.
Equalizer setup questionable		Refer to service personnel to check RF Equalizer alignment per procedure.
Input video ABSENT	The drive detects a condition where there is a lack of incoming video signal.	Check connector at rear for actual connection. Refer to service personnel.
Input video WRONG STANDARD	The drive and the video source are of different standards.	Check that the drive is set for the correct standard desired.
Interpolation NOT AUTO	Interpolate mode is set to off.	Check *home*/DIAG/SIGNAL SYSTEM/VIDEO menu. Standard setting is auto. Refer to service personnel.
No *ready* timeout!	Ready time-out function has been disabled.	Make sure machine does not damage tape or heads due to excessive wear at one location.
Perform Edit Optimization	This message appears when a new tape is loaded, editor is on, edit optimization has not been performed, and play is entered (a reminder that the drive has not been optimized to the tape).	Perform edit optimization with **AUTO OPTIMIZE** softkey per section 6.5
Picture position NOT nominal	Picture position (horizontal or vertical) has been changed.	Check picture position in *setup*/VIDEO OUTPUT menu and change if necessary.
Port 1 not communicating Port 2 not communicating	Remote Port 1 or Remote Port 2 not communicating properly when selected.	Check remote device or serial control cable.

Table 7.2 System Nonstandard Mode Messages (Continued

Message	Meaning	Suggested Action
Pseudo Random Test Signal ON	Test Signal is turned on.	Go to *Diag*, Transport, Record Drive Setup menu and turn signal OFF.
Reference NOT GENLOCKED	Sync Generator PLL is not locked to reference burst. Alternatively, Sync Generator vertical or H/2 pulse is not locked to reference video.	Check reference video input.
Reference video ABSENT	House reference video input is missing.	Check presence of house reference video at REF VIDEO IN jack.
Re-ready timeout	Occurs when Ready times out twice at same position. Machine will not enter Ready mode.	Tape must be moved (one field minimum), or Ready mode must be deactivated and then re-activated.
Scanner Current HIGH	Scanner phase adjustment required.	Refer to service personnel for adjustment.
Scanner servo disturbance	Occurs when short scanner tach interrupt occurs. System counts errors.	Refer to service personnel.
Scanner timeout	Scanner inactive for extended period.	Select mode with tape motion to reactivate scanner.
Search point NOT FOUND	System could not find search point.	Check for non-continuous timecode, or invalid search point.
Search point df ff MIXED	Tape time and requested search time have different modes.	Check tape timer FF/DF mode in System Setup menu.
Still frame Timeout	DCT 1700d has remained in still frame mode for extended period.	Select mode with tape motion, or re-select the *ready* button.
Supply arm OUT OF TOLERANCE	Supply tension arm position is out of tolerance.	Check minimum and maximum settings in Transport Setup menu.
Supply reel current HIGH	Not used.	
Takeup arm OUT OF TOLERANCE	Takeup tension arm position is out of tolerance.	Check minimum and maximum settings in Transport Setup menu.

Table 7.2 System Nonstandard Mode Messages (Continued)

Message	Meaning	Suggested Action
Takeup reel current HIGH	Not used.	
Tape Standard WRONG	Video tape is wrong standard for the current setting of the drive.	Remove tape and reset the drive or insert tape of the correct standard.
Timecode generator NOT JAM	System expects timecode generator to be in jam mode.	Check timecode generator mode in the *tc* menu.
Tracking NOT AUTO	Auto Tracking not active	Press *home*, DIAG, PLAYBACK EQUALIZE, TRACKING auto, to set to **on**.
Video test generator ON	Video test generator is set to on mode.	Check video test generator mode. Standard setting is off.

7.5   System Fault Messages

System Fault

Various system parameters are monitored for fault conditions. When one or more fault conditions is detected, the screen displays the highest priority message to alert the operator. The fault messages are grouped and prioritized into five categories as follows:

Table 7.3

Category	Priority
Board	1 (highest)
Power supply	2
Servo	3
Signal System	4
Tape Problem	5 (lowest)

If two or more fault conditions are activated at the same time, the message in the highest priority category will be displayed. If two or more fault conditions exist within the same category, the last one to occur will be displayed.

To view current list of activated fault messages, press **STATUS** soft key from Home menu.

Table 7.4 lists all possible fault messages in alphabetical order. The displayed message is shown in bold-face type. The first bullet item under the message defines or explains the message. The second bullet item provides suggested check procedures or actions for the operation or service personnel, though other actions might be necessary.

To clear current message from screen:

1. Press the **STATUS** soft key.

2. From Status menu, press **CLEAR CG MESSAGE** soft key.

To display list of available fault messages:

1. Press the **STATUS** soft key.

2. From Status menu, press **FAULT MESSAGES** soft key.

3. Turn the adjust knob to scroll list and select a message (highlighted).

The message

—START OF FAULT LIST—

Indicates beginning of the list.

To page through the list of messages, press the PAGE soft key on the Status menu.

Table 7.4 System Fault Messages

System Fault

Message	Meaning	Suggested Action
Air pressure FAULT	Air system is not operating properly.	Refer to qualified service personnel
Auto record optimize FAILED	System could not reset gains within allowable limits to achieve optimization.	ditto
Autotrack FAILED	Capstan servo failed to find optimal tracking position.	ditto
BOT sensor FAILURE	Beginning-of-tape sensor has failed.	ditto
Bad Servo Reference	Reference to Servo board is not correct.	ditto
Bad Vertical Reference	Reference to Servo board is not correct.	ditto
Board Missing	A board is missing	ditto
Bus Error	Not used	ditto
Capstan JAMMED or TACH ABSENT	Capstan stopped or no tachometer pulse.	ditto
Capstan SLIPPAGE	Capstan/tape interface has slippage. Lack of tape adhesion to capstan.	ditto
Capstan engagement movement FAULT	Capstan arm had insufficient or excessive movement, or too much motion when engaged.	ditto
Capstan servo FAILURE		Eject video cartridge and refer to service personnel.
Cartridge type WRONG	Wrong type of video cartridge loaded.	Eject video cartridge and check manufacturer's tabs and cartridge type.
Concealment occurred	A concealment was logged.	Check concealment log for details.
Control track ABSENT	No Control track.	Press CT/TC button/indicator to view signal detected on Waveform monitor. Refer to service personnel.

Table 7.4 System Fault Messages (Continued)

Message	Meaning	Suggested Action
Control Track Unlocked	The Control Track is unlocked	Check for proper adjust track or known good tape. Refer to service personnel.
Coupling servo CRASH	Coupling between capstan and reel motors is out of tolerance.	Refer to service personnel.
EOT sensor FAILURE	End-of-tape sensor has failed.	ditto
Elevator movement FAULT	Elevator has insufficient or excessive movement, or too much motion when locked.	ditto
Floppy disk error	Bad, or unformatted disk.	Eject and check disk for correct operation, check function with known good disk.
Head 1 rf LOW	Head 1 is clogged.	Clean head, if still a problem refer to service personnel.
Head 2 rf LOW	Head 2 is clogged.	Clean head, if still a problem refer to service personnel.
Head 3 rf LOW	Head 3 is clogged.	Clean head, if still a problem refer to service personnel.
Head 4 rf LOW	Head 4 is clogged.	Clean head, if still a problem refer to service personnel.
Helix movement FAULT	Helix has insufficient or excessive movement, or too much motion when locked.	Refer to service personnel.
ID Prom BAD	ID Prom is not seated in socket on motherboard correctly, or is faulty.	ditto
Loader movement FAULT	Loader mechanism has insufficient or excessive movement.	ditto
Longitudinal Timecode BAD or ABSENT	Timecode reader cannot read LTC because it is invalid or absent.	Verify correct playback using a known good tape.
Power supply 40 volts FAULT	+40V power supply has failed, or is outside tolerance limits	Refer to service personnel.

Table 7.4 System Fault Messages (Continued)

Message	Meaning	Suggested Action
Power supply 24 volts FAULT	+24V power supply has failed, or is outside tolerance limits	ditto
Power supply minus 15 volts FAULT	−15V power supply has failed.	ditto
Power supply minus 5 volts FAULT	−5.2V power supply has failed.	ditto
Power supply plus 15 volts FAULT	+15V power supply has failed.	ditto
Power supply plus 5 volts FAULT	+5V power supply has failed.	ditto
Record drive levels low	Record drive for one or more channels is set to minimum (50)	Perform auto record optimization per procedure in section 6.
Scanner NOT LOCKED	Scanner phase is out of sync with reference signals.	Refer to service personnel.
Scanner tach ABSENT	Scanner servo failure.	ditto
Spurious interrupts	CPU is being interrupted unexpectedly.	Refer to service personnel.
Supply arm MISALIGNED	Supply tension arm position out of tolerance.	ditto
Supply arm TORQUE LOW	Supply arm reaches position too slowly, or movement is not correct.	ditto
Supply arm position FAULT	Supply arm travel is incorrect.	ditto
Supply reel JAMMED	System detects jam in tape supply feed.	Check cartridge.
Supply reel TACH ABSENT	Supply motor tachometer is not producing tach pulses.	Refer to service personnel.
Supply reel servo FAILURE		ditto
Supply reel tension servo FAILURE	Supply tension servo outside limits.	Check for broken tape.
Supply servo tension ERROR	Supply servo outside limits.	Refer to service personnel.
Takeup arm MISALIGNED	Takeup tension arm outside limits.	Refer to service personnel.

Table 7.4 System Fault Messages (Continued)

Message	Meaning	Suggested Action
Takeup arm TORQUE LOW	Takeup arm reaches position too slowly, or movement is not correct.	Refer to service personnel.
Takeup arm position FAULT	Takeup arm travel is incorrect.	Refer to service personnel.
Takeup reel JAMMED	System detects jam in tape takeup.	Check cartridge and tape path.
Takeup reel TACH ABSENT	Takeup motor tachometer is not producing tach pulses.	Check tape path. Refer to service personnel.
Takeup reel servo FAILURE		Refer to service personnel.
Takeup reel tension servo FAILURE	Takeup tension servo is outside limits.	Check for broken tape. Refer to service personnel.
Takeup servo tension ERROR	Takeup servo is outside limits.	Refer to service personnel.
Tape in cartridge BROKEN	Tape is broken.	Repair tape or replace videocassette.
Thread servo motor BLOWN FUSE	Blown fuse in +48V servo circuit.	Refer to service personnel.
Thread servo solenoid BLOWN FUSE	Blown fuse in +48V helix and capstan engagement solenoid circuit.	ditto
Turntable Movement FAULT	Error occurred in the positioning of the turntable.	Eject cartridge, try again, if message reappears, reboot the drive. If upon boot up message reappears refer to qualified service personnel.
Unknown logic state FAULT	CPU detects some logic state fault that it cannot determine the cause.	Refer to service personnel.

7.6   Concealment Log

The concealment log will keep track of all concealments allowing the operator to determine whether a temporary head clog occurred, or something more dramatic occurred. Figure 7.1 shows what probably were two single field temporary head clogs and a 26 field more serious problem. In the majority of cases a single field concealment will be caused by a temporary clog of a playback or record head, and can be easily remedied if it is known where the concealment occurred, hence the log. With the knowledge of which fields or frames a concealment occurred on, one can simply re-record those edits or segments.

Conceal Log

In the case of a more serious failure such as the one illustrated, failure to correct the problem by re-recording will probably indicate tape damage.
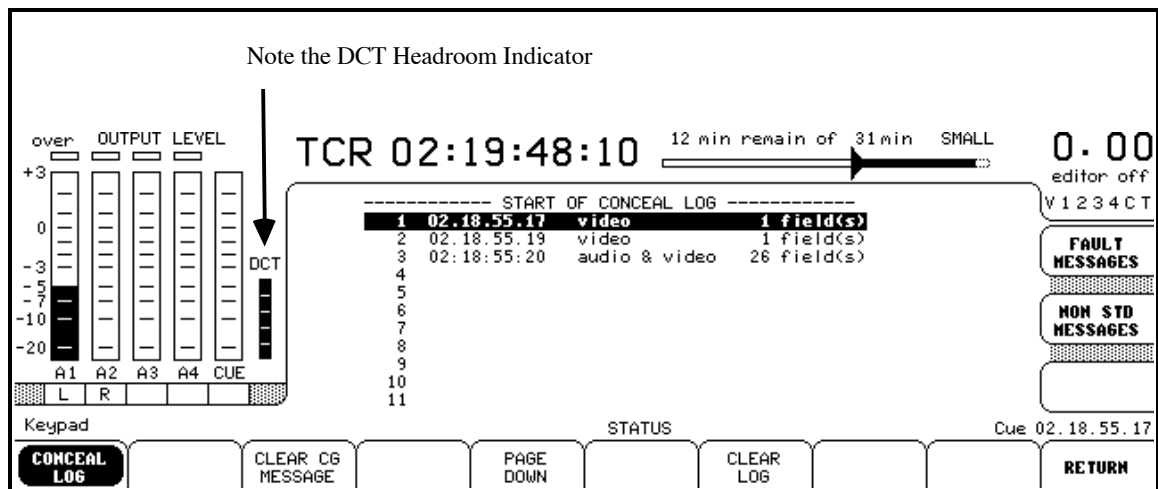
Figure 7.01 Illustrating the Concealment log

Press *status* to select status menu

Press **CONCEAL LOG** softkey to display the log and associated softkeys.

DCT Error Correction Headroom Indicator

This part of the display is indicative of the general status of the recorded signal on a drive. The indicator in Figure 7.01 shows a normally operating drive with full headroom. If one of the four record heads becomes clogged the indicator would show a reduction in the displayed full value. When the display drops to the bottom of the indicator a concealment would have occurred.

Action on Concealment for a Record Drive in an Editing situation

The recommended mode of operation for a record drive, is to select serial tally as an action on concealment, the selection is made from the system setup menu. This selection will communicate back to the edit controller that a concealment has taken place, and instruct the edit controller to abort and re-do the edit.

Action on Concealment for a Source Drive in an editing situation.

The recommended mode of operation for a source drive, is to select STOP as an action on concealment, this selection is made from the system setup menu. This selection will stop the source drive and thereby alert the editing operator, to re-do the edit. Very few edit controllers monitor the serial ports of the source machines during the edit interval, hence the requirement for the drive to stop.

Action on Concealment as a duplicating function

Making error free dubs (clones) of an original or edited master, has always had the problem of not knowing where a concealment occurred, particularly when the concealment happened as a response to a temporary head clog. Historically a temporary clog of the PLAYBACK head on the SOURCE drive would be recorded into the clones with no way of determining that they now included this error. To rectify this situation, logging concealments is a necessary action that the DCT 1700d drive will perform regardless of the action upon concealment setting. In a duplication process where several dubs are being made simultaneously, the action on concealment should be set to NONE.

The procedure upon completion of the dub is a two step process;

1. Check the RECORD drive concealment log to ensure that there are no concealments. If there were none go to step 2.

    a. If there were concealments, cue to those points and determine if they were temporary PLAYBACK head clogs. If they were temporary playback head clogs, no concealment should be detectable and all is well.

    b. If there were temporary head clogs of the RECORD head, that are now errors in the recording. This necessitates re-recording those frames over again by performing an insert edit.

2. Check the SOURCE drive concealment log to ensure that there are no concealments. If there were none all is well.

    a. If there were temporary head clogs of the PLAYBACK head they are now recorded into the tapes on **all** the record drives. This necessitates re-recording those frames over again by performing an insert edit on each record drive.

Note: *It is always good practice to re-record more material than is indicated in the log, it is therefore smart to re-record several fields before and after the one indicated in the log.*

7.7 Waveform Monitoring

Press *mon* to select monitor menu

Press **WAVEFORM** to display waveform select soft keys.

7.7.1 Video Waveform

Press **VIDEO** soft key to monitor the analog Video waveform.

7.7.2 RF Envelope Waveform

Press **RF** soft key to monitor the RF waveforms.

Figure 7.02 shows typical waveforms.

Mon

RF RECORD OR PLAY (525)

HEAD 1   HEAD 3

HEAD 2   HEAD 4
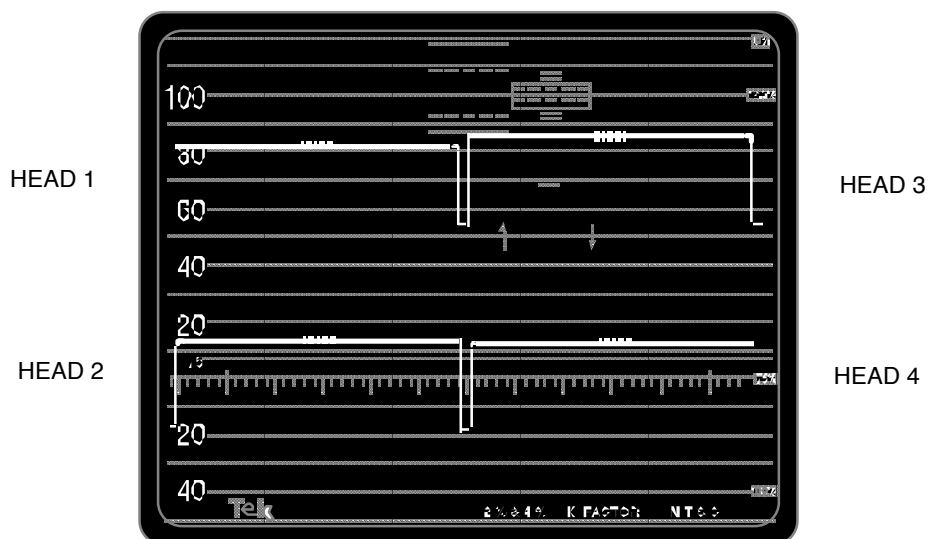
Figure 7.02 RF Waveforms

7.7.3   Timecode and Control Track Waveforms

Press **TC/CT** soft key to monitor both adjust track and timecode.

Figure 7.03 shows typical wave forms.

525 Record mode
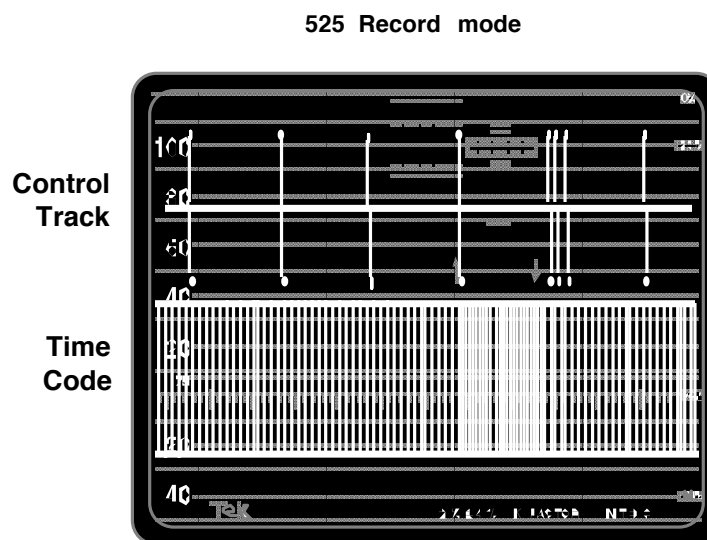
Figure 7.03   Control Track and Timecode Waveforms

7.7.4   AST Waveforms

Press **AUX SELECT** soft key until AST is selected.

Press **AUX** soft key to display AST waveforms.

7.7.5   Audio Waveforms

To view audio waveforms, press **AUX SELECT** soft key until desired audio is selected, press **AUX** soft key to enable monitoring of audio channels 1 through 4 and CUE channel.

Press **RIGHT AUDIO** soft key A1 through A4, or CUE to select waveform.

AMPEX
DCT 1700d

Digital Component Tape Drive

Operation

GLOSSARY
3
8

Section 8
Glossary

The following glossary presents some basic editing terms:

A-B Rolls	Duplicate rolls of video tape information having identical time code; required to achieve 'effects', dissolves for example, from different parts of source material that was originated on a single tape.
A and B Rolls	Separation of material into two groups of reels (A rolls and B rolls), with alternate scenes on each reel pair (A reel and B reel) to allow transitions between reels.
A to D or A/D:	An electronic device which converts an analog signal into a digital signal using a sampling process. The rate of sampling determines the resolution of detail and the process is called digitization or quantization.
Alphanumeric	A display symbol set consisting of 64 standard ASCII characters, including the twenty-six letters of the alphabet and the digits 0 through 9.
Algorithm	A mathematical equation (used in a method for compressing data.)
Ancillary Data:	All data that appears in the horizontal and vertical intervals in a digital video data stream. (See Auxiliary Data).
Archive:	The long term storage of digital data or images on a storage medium such as magnetic tape, disc or optical disc.
Artifact:	Residual visible effects or errors which are a direct result of some technical processing or transmission limitation. These are seen in many formats, and in equipment using D1 processing appear as randomly scattered green colored pixels for example.

ASIC: (Application Specific Integrated Circuit), A custom designed integrated circuit replacing many common discrete devices. Function are frequently tailored to specific equipment and tasks and therefore will often be superior in performance than general purpose devices. They typically offer improvements in speed, reliability, space and power consumption over discrete devices.

Assemble Editing: Attaching new material to the end of previously recorded audio or video information, and recording all channels, including control track and timecode.

Auto tag: Edit exit time is automatically used as entry time for next insert or assemble edit.

Automatic Editing: The operator uses soft keys, menus, and transport controls to set up edit prior to actually performing the edit.

Auxiliary Data: AES/EBU defines it as: Two channels of time division multiplexed audio data, synchronizing and other data.

Back Time: Calculation of a tape in-point by finding the out-point and subtracting the duration of the edit.

Bandwidth: Bandwidth defines the amount of information transmitted in a given time in a circuit, radio or TV channel. CCIR 601 defines luminance bandwidth of 5.5MHz and chrominance bandwidth as 2.75MHz.

Bit: An instruction in a data transmission, usually part of a byte - high status = 1, low status = 0.

Baud Rate: The rate at which data is transmitted. The baud rates must match if two devices are to communicate with one another.

Bit Rate: The rate or speed at which data is transmitted, emitted or reduced (as used in a compression system).

Cartridge: A durable enclosed container for the recording storage medium, Digital images as stills or moving video are stored on cartridges. D1, D2, D3, and DCT cartridges are used in the television industry, but while they may be similar in size each cartridge is mechanically unique, as is the format of the data or image stored on the tape.

CCIR: Comite Consultatif International des Radio-communications. The United Nations regulatory body covering all forms of communication. It both sets mandatory standards and makes recommendations.

CCIR 601: The international standard for digitizing component color television in both 525 and 625 line standards, it is derived from *SMPTE RP125* and the *EBU* Tech.3246-E.

Note: *CCIR 601 defines 4:2:2 sampling at 13.5 MHz with 720 Luminance samples per active line and 8-BIT digitizing.*

CCIR 656: The international standard for interconnecting digital television equipment operating to the 4:2:2 standard defined in CCIR 601. It is derived from *SMPTE RP125* and the *EBU* Tech.3246-E, and defines the connectors, clock rates, blanking and sync words.

Character Generator: **(CG):** An electronic device that generates letters (characters) for use in the video domain as captions (titles) in television productions. Character generators often output two signals one used as the fill video and the other used as an external key (hole cutting) input to the switcher.

C-MAC: A transmission standard using MAC, with analog sound.

Combined Edit: An edit where audio and video entry and exit points are the same.

Component Video: Video that is processed in its component form R-Y B-Y or R.G.B.

Composite (A-Video): 1. **Composite Video** - A video signal including all synchronizing pulses, where LUMINANCE and CHROMINANCE information have been combined using one of the coding (or encoding) standards NTSC, PAL, or SECAM.

2. **A Composite** - Term used as a noun to describe a multi-layered video scene.

Compression: A technique used to reduce the space used on the media occupied by a given data block. This technique can be used for any data whether it is strictly a data stream or a digital video signal. *There are many forms of compression see Discrete Co-sine Transfer, J-PEG, M-PEG.*

Configuration: Data relating to the operating line standard (525 or 625), system timing, ISO key assignments, and other user definable data. This data can generally be stored to disk or RAM memory.

Contouring: An unwanted artifact (or desired, introduced effect) similar to Posterization. Digital systems exhibit contouring when insufficient quantizing levels are used, or are intentionally introduced for special effects by devices such as switchers (Ampex DCT® 700s) or DVE's.

Control Panel: A dedicated panel which has control devices (knobs, buttons, faders) which control circuits in the signal system.

Control Processor Unit: (Central Processing Unit - CPU)

1. Circuits used to generate or alter control signals.

2. A card in the frame which controls overall drive operation.

Control Track: A synchronizing signal on the edge of the tape which provides a reference for tracking control and tape speed. Control tracks which have heavy drop outs are improperly recorded and may cause tracking defects or picture jumps.

Cue: To cause the drive to roll to a predetermined point on tape.

Cue Point: The predetermined point to which the drive is cued, which is defined by the preroll time , and is ahead of the edit point.

DCT® **(An AMPEX registered trademark)**

DCT® signified a new generation of digital products from Ampex in early 1991, with product introduction and delivery in 1992. This range of product included a recording device (DCT 1700d tape drive) with a proprietary format (footprint) onto tape. This format records a component signal using compression techniques to give the longer tape lengths of composite recording standards, with the higher quality of component recording standards. The format also utilizes greater *CORRECTION* techniques than the D1 format, which relies heavily on *CONCEALMENT* techniques, the former being a more expensive and accurate process. Other products introduced in the DCT® family are a digital switcher (DCT 700s), a DVE (DCT 500a ADO™), and a pair of editors DCT 700e & 500e)

Default: The setup condition existing when a device is first powered-up, before you make any changes.

Degauss: Term used for demagnetizing tape, discs or monitors.

Delay: The time it takes for any circuitry or equipment to process a signal when referenced to the input or some fixed reference (i.e., house sync). Common usage is total delay through a switcher or encoder.

Diagnostics: Software programming that runs a self test sequence.

Digital Cosine Transfer: A method used for compressing data using specific algorithms.

Digital Sampling Rate: This is the frequency at which an analog signal is sampled by a digital signal.

Disk: An information/digital data storage medium.
(see floppy)

Disk Drive: The machine used to record and retrieve digital information on disc.

Dither: A process used to switch the LSB(s) so as to cause them to selectively round. See Dynamic Rounding.

Drive: An industry term used to identify or qualify either a disc or tape recording device, i.e. tape drive or disc drive, whereas the storage media used is identified only by its generic name, i.e. tape or disc, and qualified possibly by the format (footprint) used to record onto the tape, i.e. D1 tape or DCT® tape.

Drop Frame: System of modifying the frame counting sequence (dropping two frames every minute except on every tenth minute) to allow time code to match a real time clock.

Drop Outs: Small bits of missing picture information usually caused by physical imperfections in the surface of the video tape.

Duration: The length of an edit (as measured by timecode or tape timer).

Dynamic Range: A measure of the spread of useful values available in a video signal. At the source dynamic range is limited by the ratio of maximum signal to unwanted noise. In a digital system *8-BITS* generally exceeds most source and viewing conditions.

Dynamic Rounding: A mathematical method of selectively rounding to an *8-BIT* result for systems that may either applied on the output of devices that generate in excess of *8-BIT* signals or on the input of devices receiving such signals.

EBU: European Broadcasting Union - A loose affiliation of European Broadcasters coordinating to standardize production, technical and transmission techniques and interests. It has set up a number of committees and made recommendations to the CCIR and was instrumental in the CCIR 601 specification definition.

Edit: Any point on a video tape where the original audio or video information is added, replaced, or altered, through clean or seamless transitions (not crash-recorded).

Edit Decision List: (EDL) - Record of all edit decisions made for a video program (such as in-times, out-times, and effects) in the form of printed copy, paper tape, or floppy disk file, which is used to automatically assemble the program at a later point.

Edit Optimize: Adjustment that matches the longitudinal control track position and rotary scanner phase of the editing Drive to the recorded material on the tape to be edited.

Edit Point: (Entry, Exit), Beginning or end point of a selected event within a program being edited on tape.

Error Concealment: No digital recording means is perfect. Errors can be detected, and means are available to mask these errors. When the recorded data is an image, the errors can be concealed by using data from previous or following lines or fields.

Error Correction: No digital recording means is perfect. Magnetic discs and tape all suffer from a small number of marginal recording areas where recording and replay is difficult or impossible. The errors can be detected, and in many systems means are available to correct these errors.

Field: A television picture is produced by scanning the TV screen with an electron beam. One complete scan of the screen is called a field. Two fields are required to make a complete picture, which is called a frame. The duration of a field is approximately 1/60 of a second in 525 and l/50 of a second in 625.

Floppy: (or Floppy Disc); A removable computer storage medium consisting of a thin flexible disk covered with magnetic oxide inside a protective sleeve within which it can rotate. Floppies are used to transport data from one computer location to another, are lightweight and inexpensive. These disks were floppy with the earlier size formats 8 inch and 5.25 inch, however modern computers have migrated to a common 3.5 inch disk, which can store 1.2-1.4 Mega Bytes of data.. See Disc.

Format: Tape recording format, i.e. PAL, NTSC, D1, D2, DCT, etc., describes the physical properties of the tape and the footprint on the tape. Can also mean the actual machine interchange adjustment to maintain its setting to conform to NTSC or other standards.

Frame: 1. A television frame consists of two interlaced fields, forming one complete picture.

                           2. The metal cabinet which contains the drives circuit boards.

Framestore: Term used for SOLID STATE digital video full frame temporary storage device, with memory for only one frame of video as on the DCT 1700d. The term is also generically used for any device that stores multiple frames of digital video in a larger storage device based on Winchester drives although could equally be applied to a tape drive if the tape contained unrelated or individual frames of video.

Freeze: Grabbing a single frame of video (stopping action if from VTR) and retaining it.

Gain: The ratio of output power to the input power for a system or component. Usually expressed in decibels.

General Purpose Interface : (GPI) A connector on the back of the 1700d or editor which allows remote control of some of the drives functions. Usually a contact closure (i.e., switch) which provides short to ground.

General Purpose Serial Interface : (GPSI) A form of translator which allows the DCT 1700d drive to talk to other devices, and to be given instructions by devices such as Editors serially.

Generation(s): The number of times a video clip is copied or processed without loss of image quality. Component digital systems (in particular DCT®) have greater transparency, numbers of generations is not as great a concern as it once was.

GenLock: A function of circuitry to adjust its synchronization such that it becomes synchronous with a reference signal and remains so.

Hertz (Hz): The unit of frequency. Equivalent to cycles per second.

Highlight:
1. In lighting to add a light which will cause an area to have more light;

2. In switchers to allow one portion of the video to have a greater luminance level;

3. In screens, monitors, displays, etc., to cause a word on the display to be brighter, commonly be inverting and surrounding the work with a box of white video.

Initialize:
1. An auto sequence that causes a machine upon power up to arrive at a default condition.

2. Record some data on a disc to allow its segments to be recognized by a controller.

In-point:	Beginning of an edit—the first recorded frame in the edit interval.
Insert:	Replace an existing segment of audio, video, or timecode information within a continuous recording. The new incoming audio and video information is synchronized to pre-recorded control track and timecode.
Interpolation:	When repositioning or reshaping digital images inevitably the new image requires more, or less or different pixels than the original image. Replicating or removing *PIXELS* causes artifacts. Interpolating the new pixels by mathematically averaging adjacent pixels produces a more transparent result.
Jam Sync:	Process of locking a time-code generator to existing recorded time code on a tape in order to recreate or extend the time code. This may be necessary because, beyond a given point on tape, time code may be non-existent or of poor quality.
Jog - Jogging:	Single-frame forward or backward movement of video tape.
Least Significant Bit:	(LSB) - This is the 'Bit' of information which contains the least significant data in any data word. Binary numbers are represented by a series of ones and zeros 1110 (Binary - base of 2) = 14 (decimal - base 10). The right most digit 0 is the LSB - Least Significant Bit.
Longitudinal :	(LTC) Time-code information recorded as an audio **Time Code** signal (typically on Audio track 2 or 3). The DCT 1700d records cue, timecode, and control track information longitudinally using a fixed head.
Mark:	Term used to describe the function of indicating to the editor where the entry or exit of the edit will be done on the fly.
Manual Editing:	The operator observes program material, and uses the Drive transport and edit buttons to perform edit as source material plays. Also known as "Editing on the fly".

Master:	The final edited tape recording from a session from which copies will be made called sub masters. These may be used for some subsequent editing to create other effects.
Master/Slave:	Software option which allows user to maintain synchronization between two or more transports using one machine as control reference (master).
Match Frame Edit:	Edit in which a scene already recorded on the master is continued with no apparent interruption. A match-frame edit is done by setting the record and source in-points equal to their respective out-points for the scene that is to be extended.
Matte Reel:	A black and white (hi con) recording on tape used as a key hole cutting source for special effects.
Menu:	A listing of conditions or other parameters displayed on some form of screen.
MHz - Mega Hertz:	Millions of cycles or samples per second
Moiré:	The spurious pattern in the reproduced television picture resulting from interference beats between two sets of periodic structures in the image. It usually appears as a curving of the lines in the horizontal wedges of the test pattern and is most pronounced near the center where the lines forming the wedges converge. A Moiré pattern is a natural optical effect when converging lines in the picture are nearly parallel to the scanning lines.
Most Significant Bit:	(MSB) - The 'Bit' of information which contains the most significant data in any data word. Binary numbers are represented by a series of ones and zeros 1110 (Binary - base of 2) = 14 (decimal - base 10). The left most digit 1 is the MSB - Most Significant Bit - here representing 2^3 i.e. 8.
MPEG:	Moving Pictures Expert Group - MPEG is involved in defining a standard for the data compression of moving pictures, and follows on from the JPEG suggestions adding extra compression available through similarities between successive frames.

Non-Drop Frame: System of time-code that retains all frame numbers in chronological order, resulting in a slight deviation from real clock time.

Non-Synchronous Source: A video signal whose timing information differs from the reference video. May be also free running.

Off-Line Editing: Editing that is done to produce an edit decision list, which is used later for assembling the program and is usually 'cuts' only. A video tape (sometimes called a work print) may be produced as a by-product of off-line editing.

One Button Macro : A list of keystrokes used to record a segment of the master tape to a Layer Archive Tape for a technique that unleashes the layering power of digital component technology. (See Post Read).

On the Fly:
1. Depressing a button causing some change while a switcher is transitioning, or during an edit.

2. Selecting a tape edit point while VTR is moving.

On-Line :
1. Available all of the time.

2. On-Line Editing (see below)

On Line: The video source(s) that are currently being fed to the program output of the device or room.

On-Line Editing: Editing that is done in a finishing suite to produce a final program master, is real time and will often use an EDL developed in an 'Off-line' suite.

Open-Ended Edit: An edit with no predetermined exit point (Assemble mode).

Operating Program: Computer software program which controls all functions of related computers and hardware devices.

Out-point: End of an edit—the last recorded frame in the edit interval.

PostRead™: An editing technique using a macro program to transfer a selected segment of material from the record machine (Master) to an "archive" or "cache" machine. After the transfer, the cached material remains match framed back to the recorder. This process bypasses the switcher, making resetting (to remove keys etc.) unnecessary. Reference edits are automatically placed in the EDL, so match framing back into the list, or into the archived material, is quick and easy. Unlike PREREAD, no source material is destroyed in the edit process.

Postroll: The frames (or seconds and frames) that the tape drive rolls tape beyond the edit exit-point.

Preroll: The frames (or seconds and frames) between the cue point and the edit in-point.

Prestriped: A tape which has had a combination of Timecode, Black, Bars and tone prerecorded onto it. Prestriped tapes provide continuous timecode through the length of the tape (analogous to formatting a floppy disk) thereby alleviating an operator from this time consuming and costly function. Prestriping is necessary to allow any form of non linear (non continuous) data insertion (editing), DCT prestriped tapes offer a standard of interchangeability that is unequaled in any other format, that only Ampex has dared to offer.

Quantization: The process of sampling an *ANALOG* waveform to provide packets of digital information representing the original analog signal.

Reel Number: Number assigned by operator to each reel or cassette of video tape used in the editing session. The reel number identifies each reel or cassette on edit list for final assembly or for future revisions.

Reference Video: Video signal which is used to synchronize different pieces of video equipment by providing a common timing signal. It is generated from a single source and distributed. Typically, reference video consists of color black or color bars.

Register: Term used for a memory storage location. Each can store the data for a complete switcher setup.

Reset: To activate a restart sequence to a CPU, ILC or other device which has locked up or is for some other reason not responding correctly.

Resolution:
1. The capability of making distinguishable individual parts of an image. Measure of the greatest amount of detail that can be seen, or resolved, in a reproduced image.

2. The number of bits used to define or process a digital signal.

Retentivity: The relative measure used for the memory of a tape (or other magnetic media), its capability to retain data.

RP 125: SMPTE recommended practice 125- Bit-Parallel Digital Interface for Component Video Signals.

RS 422: A medium range serial control standard, sending bi-directional data between devices on two pairs of ECL signals. Full specification defines a 9 pin D type connector with optional use of the other connections (commonly used for grounding and noise immunity screening).

Run Length Coding: A system of encoding for digital data to reduce the amount of storage needed to hold the data without loss of information. Each coded item consists of a data value and a number of adjacent PIXELS with that value. This is a very efficient way of storing large areas of flat color and text.

Sampling: Process applied to convert an ANALOG signal into a series of digital values, by using a binary signal of much higher frequency to slice the analog signal and reading values at the intersection points.

Screen: The face of a monitor, TV or terminal.

SCSI	(Small Computer Systems Interface) A general purpose parallel interface designed for connecting one or more computers and one or more peripherals. SCSI defines the connectors used (50 way) as well as the command structure set.
SCSI 2:	(Small Computer Systems Interface) A variation of the SCSI interface offering a faster transfer rate through the use of the balanced connection mode and an extended set of commands.
Sel-Sync™:	The Sel-Sync mode pre-dates the video recorder since the earliest reference is 1955, where Les Paul and Mary Ford pioneered the sound -on - sound recording. This was originally accomplished on a single (full) track audio recorder and involved passing the recorded tape by the play head then the erase head and the record head. In this manner the previous recording was played and then erased and then the new recording was made, which usually was a different portion of the accompaniment or a different voice mixed with the original recorded signal external to the recorder. Later developments of Stereo recording eliminated the unique head arrangement for Sel-Sync and use the common erase -record- play configuration. This mode then required the record head of one cannel to be switched into the playback electronics in place of the playback head. This then accomplished the syncronization with the new recording on the next track since both the recording heads were aligned across the width of the tape. This mode was also desirable since it did not erase the previous recording in the process of making the next recording. The value was also gained in normal playback since the original recording and the new recording could both be played back and mixed in and external mixer at a later time. The DCT700d includes the necessary audio advances to allow this time proven method to be used in todayís modern digital world.
Serial Control:	Generally used to describe remote control of a device down a twin data line. The control data is transmitted down this line in a serial form, i.e. one control signal after another. Not to be confused with serial video data.

Serial Input:　　An input option to digital devices which allows the input data transmitted to it, to be in a serial form rather than a parallel form. It therefore requires only one cable compared to the normal eight of the parallel format and can be transmitted over greater distances without amplification.

Serial Interface:　　A remote control connection which allows all drive functions to be controlled remotely by a computer editor. Data is transmitted serially between the editor and the drive at selectable baud (transmission) rates.

Setup Mode:　　The functional level in which you can program many of a system's parameters, such as; operating levels, line standards, protocols, phasing, baud rate, parity, and bus address to match the communications standards of an external editor.

SMPTE:　　Society of Motion Picture and Television Engineers. An organization originated in the United States with international branches (chapters), which includes representatives of manufacturers and individuals working in the film and television industry. It has working committees which make recommendations (RP 125 for example) to the CCIR.

SoftKey:　　A button which has multiple functions based upon selections made with other buttons or from other menu select buttons.

Software:　　Operating instructions loaded into computer memory that control how and when system hardware will execute its operations.

Solid State Recorders:　　Recording devices storing data entirely on integrated circuits, normally DRAM. These device have very fast access times and are inexpensive, however currently have relatively small storage capacity . The main draw back is that they have volatile memory, meaning if there is a power loss all data is lost unless there are back-up precautions taken and built into the design of the system. The data is non transportable and must be moved to another medium or the entire recorder must be moved.

Spatial Interpolation:	Interpolation across a static frame. This is used to create texturing and filtering effects (such as crispening and softening). Used extensively in digital effects devices to ensure clean ANTI-ALIASED images.
Split Edit:	(Audio/Video), Edits with different entry/exit points for video channel and audio channels .
SWR:	Standing Wave Ratio. The ratio of transmitted power to reflected power in transmission line's, antenna systems, connectors, etc.
Sync:	The portion of an encoded video signal which occurs during blanking and is used to synchronize the operation of cameras, monitors, and other equipment. Horizontal sync occurs within the blanking period in each horizontal scanning line, and vertical sync occurs within the vertical blanking period.
Synchronization:	To cause precise coincidence of two or more sync pulse's.
Synchronized:	To happen at the same time. Precise coincidence of two or more sync pulse's.
Tally:	A light which lights up to indicate that the associated push-button has been selected or to indicate that the associated input to the switcher is on-air. Also a relay closure to activate a remotely situated lamp, i.e. on top of a camera, to warn the production crew which camera in 'on air'. Most monitors have tally lights and common practice is to connect them to the switcher tally output so that the director can see which source on 'on air'.
Temporal Interpolation:	Interpolation between the same point in space on successive time frames. Can be used to provide motion smoothing.

Terminate:	To complete a circuit by connecting a resistive load to it . A video termination is typically a male BNC connector which contains a 75 ohm resistive load. All electronic devices must be terminated, or it will result in a variety of problems such as circuits overheating,, crosstalk and high SWR. Some devices having a single connector are internally terminating, other devices may have a terminating switch, while others have looping inputs. Any unused looping inputs or outputs must be terminated in 75 ohms to ensure proper signal levels.
Time Code:	Electronically generated digital clock information which is recorded onto tapes on a special track such that an editor can accurately locate individual frames (fields) of video information for editing purposes. The SMPTE standard for encoding time in hours, minutes, seconds and frames and video.
Time Code Generator:	Signal generator designed to generate and transmit SMPTE time code.
Timecode Editing:	Selecting edit points using keypad to enter or transfer timecode positions or values to edit entry and exit registers.
Transport:	Term used for any machine using motors usually meaning a VTR, DTR DVTR or video disc machines. More specifically the assembly which contains the motors and guides.
Trim:	Add to or subtract from an edit time or duration, using hours, minutes, seconds and frames.
TSO:	Tape Speed Override.

1. Allows the edit controller to control the capstan speed of the selected transport + or -10%. TSO is especially important when tape machines need to be exactly synchronized before finalizing an edit.

2. Method of simultaneously changing the speed of the capstan and scanner on a digital tape drive to recover all audio packets during a variable speed operation.

User Bits: Bits in a time code sequence that are user definable; i.e. to give the sequence a name or to add the date, etc.

Vertical Interval: (Blanking) - The portion of the video signal that occurs between the end of one field and the beginning of the next. During this time, the electron beams in the cameras and monitors are turned off so that they can return from the bottom of the screen to the top to begin another scan.

VITC: Vertical Interval Time Code. This time code information was recorded on lines 17-19 in the analog domain, however it has become customary in the digital domain to record this data on line 14.

Voice Over: The term used for a voice track on the video tape which is not coming from anyone in the scene, as in a commentator when he/she is talking about a scene and the camera is showing full screen the scene.

Voice Track: The term used for a voice or audio signal when deposited on a video tape. This is usually a separate track on the video tape and there usually more than one to accommodate foreign language simultaneous recording or stereo recording.

YCrCb: The digital LUMINANCE and color difference signals in the CCIR 601 coding. The Y luminance signal is sampled at 13.5 MHz and the two color difference signals are sampled at 6.75 MHz co-sited with one of the luminance samples.

YIQ: The *LUMINANCE* and color difference signals in the *NTSC* system. I and Q are the scaled and matrixed color difference signals used to modulate the *NTSC* subcarrier to make *CHROMINANCE* in the NTSC system.

YUV: 1. U and V are the scaled and filtered color difference signals used to modulate the *PAL* subcarrier to make *CHROMINANCE* in the PAL system.

2. Used commonly to describe Luminance and color difference signals in *COMPONENT* systems.

ZITS:　　　　Popular acronym for short term errors on a digital television system.

4:1:1　　　　One of the ratios of sampling frequencies used to digitize the *LUMINANCE* and color difference *COMPONENTS (Y,CR,CB)* of component video. In a 4:1:1 system there is one sample each of Cb and Cr for every four Y samples.

4:2:2　　　　One of the ratios of sampling frequencies used to digitize the *LUMINANCE* and color difference *COMPONENTS (Y,CR,CB)* of component video. The term 4:2:2 illustrates that for every four samples of Y, there are 2 samples of each Cb and Cr, this system has double the *CHROMINANCE* bandwidth of the 4:1:1 system.

4:2:2:4　　　The same as the 4:2:2 system but the key signal included as the fourth *COMPONENT*, is also sampled at 13.5 MHz.

4:4:4　　　　One of the ratios of sampling frequencies used to digitize the *LUMINANCE* and color difference *COMPONENTS (Y,CR,CB)* of component video. In this ratio there are always an equal number of samples of all components.

4:4:4:4　　　The same as the 4:4:4 system but the key signal included as the fourth *COMPONENT*, is also sampled at 13.5 MHz.

8-Bits (=1 Byte):　A group of associated 'Bits" used collectively to describe a parameter, level or feature, offering a range of 256 different levels. A random change of one Least Significant Bit (LSB) in 8 bit represents an signal to noise ratio of approximately 54 dB. This realistically exceeds the noise performance of most analog video sources, recording and transmission devices and systems. 8-Bits was therefore chosen as a practical and commercially realistic standard for the industry.

10-Bits:　　The CCIR 601 digital component standard specifies **8-bits** to defines *RESOLUTION* for *LUMINANCE* and *CHROMINANCE* signals and the **D1**, **D2** and **DCT** formats digital tape formats specify 8-bits recorded on tape. Two extra bits can be carried (if available) between equipment via the 25 way parallel or serial interconnections.

Note 1: *The two extra bits offer some improvement of images only when the source, recording process and replay system operate using the same bit rate. This is rarely the case, and is applicable only with electronically generated graphics, as most video comes from either of two analog devices- a video tape recorder, or an analog film to tape transfer device, in either case the above signal to noise limitation exists and the extra two bits only define the NOISE in greater detail.*

Note 2: *The number of bits used for external connection should not be confused with the internal precision processing within devices, for example switcher keyers and mixing circuits will often be using 12, 16 or higher bit processing internally.*

AMPEX
DCT 1700d

Digital Component Tape Drive

Operation

SUPPLEMENT

ELECTRONIC FILM MASTERING 9

AMPEX

DCT 1700d

625²⁴

Electronic Film
Mastering System

DCT 1700d Tape Drives with the updated Digital Video PWA (1547020) now permit play-back operation of 625/25 frame recordings at 625 lines, 23.976 frames - as well as the normal record playback of 525/30 and 625/25 television standards. A hardware change has been made in the new PWA to allow the software to identify that it is indeed a 625/24 compatible board. Software version 3_3_5.FRD or later is also required.

The procedure for selecting the 24 frame mode is as follows:

1. **Ensure** that the DCT 1700d Tape Drive is set to **Normal 625/25** operation.
2. Select the **SETUP** menu.
3. Press the **INSTALL** soft-key to select the **INSTALL** section of the setup menu.
4. Use the **ADJUST KNOB** to highlight the menu entry **TV LINE STANDARD.**
5. Enter the code number **62524** on the numerical keypad section of the control panel.
6. Verify that the **KEYPAD** section of the control panel display reads 6.25.24
7. Press the **CHANGE** soft-key twice to initiate a reboot of the system for 625/24 operation.
8. When the system has rebooted, verify that the **HOME** menu indicates the selected standard.

To revert to 625/25 operation the use of the code number is not required, the procedure being the same as for normal operation.

The updated Digital Video PWA is intended for playback only at the special speed. An upgrade to allow both playback and recording of 625/24 is available for all DCT tape drives. Please note that the 625/24 mode is designed for playback at this speed so certain 'trick' features may not work properly.

Although most picture monitors appear to lock horizontally and vertically to the 625/23.976 signal, the color subcarrier frequency from the video monitor composite output of the DCT 1700d is too low to permit color operation. This frequency has been changed proportionally with the change in clock frequency and will be approximately 95.6% of the normal PAL subcarrier frequency.

DCT®